

THE BIENNIAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

Agricultural College of Utah

For the Years 1903, 1904.

ACCOMPANIED BY

THE REPORT OF THE PRESIDENT, AND THE SECRETARY'S
REPORT OF THE RECEIPTS AND
DISBURSEMENTS.

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BOARD OF TRUSTEES

—OF THE—

Agricultural College of Utah,

For the years 1903 and 1904.

To the Governor and Legislative Assembly of Utah:

The trustees of the Agricultural College of Utah have the honor to present their report for the biennium, January 1, 1903, to December 31, 1904.

For detailed statements regarding the condition and requirements of the College, throughout the different departments, you are respectfully referred to the report of the President, which is submitted, with our full approval, as a part of this report. A statement of the receipts and expenditures during the past two years, and an inventory of the College property in detail, will be found in the appended report of the Secretary.

We have pleasure in reporting that there has been a large increase in the enrollment during the past two years, and a marked growth in all the affairs of the institution. The discipline is unusually good, and there is a great improvement generally in the character of the student body. It is gratifying to note that a much larger number of students are entering the College from other institutions of higher learning and from the high schools of Utah and adjoining states, for the distinctive and more advanced work of the College, and that there is a smaller attendance in the preparatory course. The improvement in the public schools should make it practicable within a few years to discontinue entirely the preparatory work in the College.

On account of the great increase in the amount of technical and advanced work in the different schools of

the College, and the consequent increase in the demand for instructors, room and equipment, there is of necessity a large increase each year in the amount required to meet the needs of the institution.

We direct your special attention to the President's report of the requirements of the College for the next biennium. Without repeating the estimates given therein, we desire to emphasize our concurrence in the same, and to urge the importance of an appropriation for the full amount. There are other pressing needs of the institution than those enumerated, but the financial condition of the State, and the requirements of other institutions, have been kept in view in considering the demands of the Agricultural College for the next two years; and the estimates have been reduced to the lowest possible amount consistent with thorough and efficient work.

Respectfully submitted,

W. S. McCORNICK,
President Board of Trustees.

January 7, 1905.

AGRICULTURAL COLLEGE OF UTAH

President's Biennial Report

1903 and 1904.

To the Board of Trustees, Agricultural College of Utah,

Ladies and Gentlemen: In accordance with the requirements of law, the President of the College respectfully submits his report for the biennium ending December 31, 1904, together with a statement of the condition of the institution and of its requirements for the biennial period from July 1, 1903, to June 30, 1907.

For detailed information concerning the several departments of instruction, the Experiment Station, the Arid Farms, Farmers' Institutes, and the financial condition of the College, your attention is respectfully invited to the Appendices, which are submitted as a part of this report.

The period covered by the report has been one of unusual growth and prosperity for the Agricultural College. Additional buildings and equipment have been provided, and various improvements have been made in the different departments. There has been a marked increase in attendance, the faculty has been enlarged, the courses of study have been strengthened, and a higher standard of efficiency has been maintained throughout the institution. The work of the biennium has been characterized by earnestness and fidelity on the part of both faculty and students. A larger percentage of the intrants than ever before have come from other institutions of higher learn-

General Statement.

ing and from the high schools of Utah and adjoining states for the distinctive work of the College. It is a matter of great satisfaction to the faculty, and cause for sincere congratulation to the state, that so many are taking advantage of the opportunities afforded them by this institution for thorough, technical training in preparation for lives of greater influence and usefulness.

STUDENTS.

The tables of statistics in the appended report of the Registrar give details as to student attendance. The total number of students enrolled has been, for the year 1902-1903, 545, representing twenty-one different counties of Utah, twelve different states, and Canada; for the year 1903-1904, 623, representing twenty-four counties of Utah, thirteen different states, and Canada. The registration for the current year, 1904-1905, is at present incomplete, as large numbers of students enter in January. The number registered on December 22d was 586, from twenty-three counties of Utah, fourteen different states, and England. The present enrollment would indicate a total registration for the present year of about 725. From the time the College was first opened in 1890, to 1903-1904, the number of counties in Utah represented has increased from nine to twenty-four; and the number of different states, including foreign countries, from four to fifteen.

An investigation has been made for the purpose of ascertaining the vocations from which the students have come. The following classification shows the wide range of the College constituency: Of the students in attendance on March 25, 1904, 62 per cent were from the families of farmers, 14.8 per cent from the families of mechanics and laborers, 15.06 per cent from the families of merchants and bankers, and 8.07 per cent from the families of lawyers, engineers, teachers, physicians, dentists, etc. From an investigation made on December 15th, of the present year, the following table has been prepared, showing more in detail the occupations of the students' parents or guardians:

Farmers and dairymen	53.71 per cent
Mechanics and laborers	14.00 per cent
Merchants	11.89 per cent
Miners	4.88 per cent
Employees, including clerks and book- keepers	3.06 per cent
Teachers	3.19 per cent
Traveling salesmen, real estate and in- surance agents	2.31 per cent
Civil Engineers	1.7 per cent
Railroad employees	1.48 per cent
Bankers	1.28 per cent
Lawyers	1.28 per cent
Physicians and dentists .....	.63 per cent

Similar investigations have been made in other institutions, and it is interesting to note the striking contrasts shown by a comparison of the figures available concerning these institutions with the above percentages. In the University of California, for example, only 20.3 per cent of the students are from the families of farmers, and 10.2 per cent of mechanics and laborers, while 21.5 per cent are from the families of merchants; in the University of Wisconsin, 33 per cent of the students are sons of farmers, 19.5 per cent are sons of merchants, and only 6.6 per cent are sons of mechanics; while in Yale, as many as 50.7 per cent represent business men, 19 per cent lawyers, and 10 per cent clergymen. It is probable that not a very different result would be obtained if a census were taken of the staff of instruction in each of the above institutions.

The ages of the students range from fourteen to fifty-three, most of them being between fifteen and twenty-four. The average age was 19.29 for 1900-1901, 19.68 for 1901-1902, 19.44 for 1902-1903, and 19.52 for 1903-1904. The ages of the students who have already registered this year range from fourteen to fifty, the average age being 19.33.

The proportion of women among the students has

slightly increased. In 1900-1901, out of a total of 380, 104 were women, 276 were men; for the year 1903-1904, out of a total of 623, 186 were women, and 437 were men. The percentage of women for the four years is as follows: 1900-1901, 27.36 per cent; 1901-1902, 27.9 per cent; 1902-1903, 30.64 per cent; 1903-1904, 30 per cent. The percentage of increase in the number of women in attendance is 78.8 per cent, of men 59.4 per cent.

Since the College was established, 150 students have graduated, 86 with degrees and 64 with certificates. Those graduating with degrees have represented the different schools of the College as follows:

Graduates. Agriculture, nine; Domestic Science, sixteen; Commerce, twenty-five; General Science, twenty-one; Engineering, twenty-seven. Of those who have received certificates of graduation, three were from Domestic Science, nine from Domestic Arts, thirty-one from Commerce, and nine from Mechanic Arts.

The average age at graduation of recipients of degrees is 21.9; of certificates, 20.5. The graduating classes of 1903 and 1904 numbered twenty-one and twenty-nine respectively, the largest classes in the history of the institution. Ten degrees were conferred in 1903 and fourteen in 1904, the other graduates receiving certificates.

Success of Graduates. The graduates of the College have been remarkably successful in obtaining important positions. Among those who have received their degrees from the institution are college and university professors and instructors, employees in the U. S. Geological Survey and Department of Agriculture, principals of public schools, practicing engineers, accountants, chemists, bank cashiers, merchants, managers of large farms, and creamery, flouring mill, and knitting factory managers, etc.; while hundreds of those who have pursued the more elementary courses are eminently successful in the different lines in which they have received instruction. The demand for graduates far exceeds the supply.

A comparative statement covering the period of the

present administration may be of interest as showing the growth of the College, and indicating the direction in which it is developing. The following table gives for each of the four years, 1900-1901 to 1903-1904, the total registration, and the number and proportion (per cent) of students in each of the several schools, and in the preparatory course.

Enrollment by Schools.

SCHOOLS	1900-1901		1901-1902		1902-1903		1903 1904	
	Stu-dents	Per cent	Stu-dents	Per cent	Stu-dents	Per cent	Stu-dents	Per cent
Agriculture.....	17	4.5	23	4.4	47	8.5	74	12.5
Dom. Science and Art ..	57	15.2	82	16.	116	21.3	134	22.7
Commerce	44	11.6	109	21.	104	19.	100	16.9
Eng. and Mechanic Arts	74	19.4	111	21.6	112	20.6	160	27.
General Science	14	3.6	14	2.7	14	2.6	17	2.9
Specials.....	14	3.6	8	1.6	16	3	5	.8
**Preparatory.....	160	42.1	169	32.7	136	25.	106	17.
Total.....	380		516		545		*623	

* Including twenty-seven students in the Summer School.

** Including students who are preparing for engineering courses, and who take shop work during the second year. If they were classed with Mechanic Arts students, the showing would be more favorable to Engineering and Mechanic Arts, in comparison with the other technical schools. In General Science, only students of College grade are given, while the technical schools include students in the high school courses.

From the above table it is seen that there has been a gradual relative decrease in the number of students taking the preparatory and general courses, and a correspondingly greater relative increase in the attendance in the regular technical courses. This is shown in the following table, which gives the proportion of all students enrolled for each of the years under consideration, in each of these three divisions:

	1900-1901	1901-1902	1902-1903	1903-1904
Preparatory	42.1%	32.7%	25.4%	17%
Preparatory and General	49.3 %	37 %	30.6%	20.5%
Regular Technical	50.7 %	63 %	69.4%	79.5%

As indications concerning the lines of development, the above figures show that while there has been a decrease from 49.3 per cent to 20.5 per cent in the proportion of students in the general work, there has been an increase from 50.7 per cent to 79.5 per cent in the proportion of students in the regular distinctive courses. The proportionate decrease in the number of general and preparatory students has been 58 per cent, while the proportionate increase in the number of students pursuing the regular technical courses has been 60 per cent. Furthermore, it will be observed that the total increase in the enrollment from 1900 to 1904 was 64 per cent, but that the increase in the number of students registered in the regular courses in Agriculture was 335.2 per cent; in Domestic Science and Arts, 135 per cent; in Commerce, 150 per cent; in Engineering and Mechanic Arts, 116.2 per cent; and in General Science, 21.4 per cent.

The registration for the present year being incomplete, it is impracticable at this time to include in these percentages the attendance for 1904-1905, but the enrollment to date indicates a development along the lines of the above comparisons far greater than during any preceding year.

Regarding the grade of work being done, it is important to note that there has been a relative decrease of 60 per cent in the number of students in the preparatory course. The actual decrease for the four years has been 33.7 per cent. If the comparison be made between the number of preparatory students in 1899-1900 and in 1903-1904, the actual decrease is 57 per cent.

The above statements show the very rapid growth of

**Significance
of Tables.**

the College in the matter of enrollment and in the grade and character of work done. Considering the brief period

Conclusions. covered by the report, the showing in some respects is most remarkable. It indicates, beyond question, the directions in which the institution is moving. There is a strong tendency to the courses of the distinctive schools. Students are coming to the College for the special advantages and preparation here afforded them. A larger proportion of the intrants each year continue until their courses are completed, more advanced work is given, and a higher standard of instruction is maintained throughout the different departments.

The marked advancement the College has made during recent years may be attributed largely to the following: first, the Faculty has been enlarged and strengthened, and a more complete organization effected throughout the institution, making possible a division of classes into small sections, and thereby insuring greater attention to the individual needs of students; second, large additions have been made to the buildings and other equipment required by the different departments for thorough and efficient work; third, the students who have entered, therefore, not only have become interested in their work and satisfied with their progress, but have used their influence to have others also attend this institution; fourth, the graduates and former students have been unusually successful in obtaining good positions, and in making practical application of their college work; and fifth, there has been a rapidly growing appreciation among the people of the value of the kind of training provided by the College.

**Reasons
for Growth.**

FACULTY.

At present the Faculty numbers 57, including members of the Experiment Station Staff, and five instructors in Music who have private work of instruction only. Of these, there are 15 professors, one associate professor, 5 assistant professors, 17 instructors, and 8 assistants, be-

sides the Librarian, President's private secretary, and two assistants in the Experiment Station who have no work of instruction. Five professors, one associate professor, and two instructors divide their time between the instructional work and the work of the Experiment Station. Of these, one professor devotes one-fourth of his time only to instructional work, two professors one-half of their time, one professor one-third of his time, and one associate professor two-thirds. Two instructors devote part of their time only to work of instruction, and seven assistants are pursuing regular courses in the institution.

Numbers. There are also a number of students who assist in the laboratory work in science, in the shops, in the Library, and in the clerical work of the different offices. On the basis of full time for each instructor, the aggregate instructional work during the present year is equivalent to the full time of 37 instructors. On this basis also, the instructional work in 1902-1903 and 1903-1904 was equivalent to the full time of 31 and 35 instructors respectively.

Division of Work. It is interesting to note the breadth of training represented in the Faculty. The members of the Faculty have attended 33 different colleges and universities, including five institutions of Europe and one of Canada, but excluding institutions in which high school or preparatory work has been done, as follows:

Professional Training.

	Total Number of Faculty having had Training in each Institution	Total Number of Faculty having received Degrees from each Institution
Agricultural College of Utah	31	19
Art Students League.....	1	
Augustana College	2	2
Ashmore School of Expression.....	1	
Bowdoin College.....	1	1
Cornell University.....	2	1
Harvard University	7	6
Illinois Wesleyan	2	2
Indiana University	1	1
Indiana State Normal	1	
Iowa State Normal	1	1
Iowa Agricultural College.....	2	1
Kansas Agricultural College.....	1	1
Lincoln Normal University	1	1
Mass. Institute of Technology	1	
Miami University	1	1
Michigan Agricultural College.....	1	1
New York School of Art.....	1	
Ohio State University.....	2	
Polytechnicum at Zurich	1	
University of Alabama	1	
University of Bordeaux	1	
University of Berlin	1	
University of Chicago.....	9	
University of Colorado	1	
University of Göttingen	3	2
University of Michigan	1	1
University of Minnesota	1	1
University of Paris	1	
University of Toronto.....	1	1
University of Utah	3	1
University of Wisconsin.....	1	1
Wooster University.....	1	1
	33	20

It will be observed that degrees have been received from as many as 19 different American institutions and one European institution, the number of degrees received from each varying from one to 19, the University of Göttingen being represented by two, Harvard University by six, the Agricultural College of Utah by 19. A large number of the Faculty have attended two or three different American universities, and two professors have received training in three different European institutions.

Of the total number in the Faculty, 31 have attended the Agricultural College of Utah. Of these, 19 have received degrees. Of the 31 who have attended the Agricultural College, seven have also attended different eastern universities, while two of these have received degrees from other institutions. The twelve members of the Faculty who have attended the College, but have not received degrees, are employed as assistants in the sewing rooms, in the household science laboratories, and in the shops. They have completed the high school courses in the schools in which they are employed, and have received their certificates of graduation.

During the period covered by this report, four professors have resigned their positions in the College because of superior inducements offered them elsewhere. As reported two years ago, such frequent changes in the

Resignations. professorships are a serious disadvantage to the institution. Much improvement in this respect, however, cannot be expected until it

is possible to make a substantial increase in the salaries paid the heads of departments. The Agricultural College of Utah is still paying lower salaries to full professors than are paid for the same work in many other similar institutions. The great advancement made by the land grant colleges generally throughout the United States during the past two years, and the consequent increase in the demand for capable and experienced specialists to fill positions in these institutions, emphasize the force of the following statement of the President in his last biennial report to the Board of Trustees:

"The demand for men and women who are able to do the work required in agricultural colleges, and similar institutions throughout the country, is greater than the supply. Consequently it is impossible to retain in the service of the College for any length of time professors whose experience, training, and ability, qualify them for the most successful work, unless the salaries approximate, at least, those paid for similar work by other colleges. Changes in the heads of departments unavoidably result in corresponding changes, more or less great, in both method and policy. Besides, it requires several years of practical experience with students and in the administrative work of a department for a

young man, however scholarly he may be, to qualify for the responsibilities of a professorship. To allow professors, therefore, who have acquired that wisdom and breadth of scholarship which come only from years of experience, to withdraw from the College because of greater financial inducements offered by other institutions, is objectionable in the extreme. The stability and character of the work of all the departments depend largely upon permanency in the positions of the professors. Hence it is of the utmost importance in considering the requirements for the next two years that provision be made for such increase in salaries as may be necessary in order that too frequent and undesirable changes in the faculty may be avoided."

Comparatively few changes have occurred in the faculty and in the staff of the Experiment Station during the past two years.

On February 1, 1903, Rena Baker, who for three years had been Instructor in English, resigned her position, and was succeeded by Annie Pike.

On March 28, 1903, D. Earle Burchell, who in September, 1902, had succeeded Prof. Faris as Professor of Commerce, resigned his position to accept a similar professorship in the School of Commerce, University of Wisconsin; Herbert W. Hill resigned as Instructor in English for the purpose of doing advanced work in the University of Chicago; Dr. Karl R. Moench, who since 1901 had been in charge of the work in Modern Languages, resigned his position, and was succeeded by Albert Edgar Wilson, A. B., of Ogden.

On April 4, 1903, Annie Pike, Charles F. Brown, and Julie Winge Ostien resigned their positions as Instructor in English, Instructor in Civil Engineering,

Faculty Changes in Detail. and Instructor in History and English, respectively; John Andrew Bexell, A. M., Augustana College, was elected Professor of Commerce; William Jardine, B. S., Agricultural College of Utah, was elected Instructor in Agronomy; William Arthur Jensen was elected Instructor in Stenography and Typewriting; John Haslam Bankhead was promoted from Assistant in Commerce to Instructor in Commerce; M. Elizabeth Wyant, Ph. B., University of Michigan, was

elected Instructor in English; Joseph W. Jensen, B. S., Agricultural College of Utah and S. B., Harvard University, was elected Assistant Professor of Civil Engineering; Elizabeth Church Smith, B. L., University of Wisconsin, was employed as Cataloguer in the Library; and Elmer George Peterson was employed as Assistant in Zoology and Entomology.

In June, 1903, William Duke Beers, who for two years had been Instructor in Military Science and Tactics and Assistant in Civil Engineering, resigned to accept a position in the Civil Service of the U. S. Geological Survey; Myrtie Barber resigned her position as Assistant in Household Science; J. A. Anderson of Salt Lake City, a student of the Royal Conservatory of Music at Leipzig, was employed as Instructor in the School of Music. Prof. George L. Swendsen, who since 1898 had been in charge of the work in Civil and Irrigation Engineering, was appointed District Engineer in the Civil Service of the U. S. Geological Survey, but retained his position in the College, expecting to be able to devote considerable time, particularly during the winter months, to his College duties. The responsibilities, however, of his government position became such that it was necessary to relieve him of all his College classes, and accordingly, at a meeting of the Board of Trustees held in April, 1904, Prof. Swendsen's resignation as Professor was accepted, though he still continues with the institution as a non-resident lecturer in irrigation engineering.

In July, 1903, Walter Wesley McLaughlin was relieved of his work as Instructor in Mathematics and Engineering, and was placed in charge of the Station work in Irrigation Engineering.

In August, 1903, Henry Delp Styer, Capt. U. S. A., was detailed by the War Department and employed by the Board of Trustees as Professor of Military Science and Tactics.

On October 1, 1903, Mrs. Sara Godwin Goodwin, who, during the year 1896 was a member of the Board of Trustees of the College, from 1896 to 1899 was Librarian and Instructor in Music, and since 1899, Librarian, resigned her position, and Miss Smith, Cataloguer, assumed her duties as acting Librarian.

In March, 1904, Samuel Bailey Mitton, who, since

1900, had been Instructor in Music, Chorister, and Leader of the Military Band, resigned his position in the College to engage more exclusively in business.

On April 23, 1904, Peter Weston Maughan, who had been Secretary since March, 1900, resigned his position, and was succeeded by Prof. John Andrew Bexell of the School of Commerce as Secretary, and Francis David Farrell, a graduate from the short course in Commerce, as Assistant Secretary; Elizabeth Church Smith was elected Librarian; J. A. Anderson resigned as Instructor in Music; Albert Edgar Wilson of the Department of Modern Languages was given a leave of absence for two years to study in Europe; Joseph Eames Greaves, B. S., Agricultural College of Utah, was employed as Station Assistant in Chemistry; and Howard Peter Madsen, a graduate from the Mechanic Arts course of the College, was employed as Assistant in Carpentry.

In June, 1904, Mamie Morrell resigned as Assistant in Household Science, and Louie Thomas resigned as Assistant in Sewing.

On August 27, 1904, George Washington Thatcher of Logan, a student of the New England Conservatory of Music, was employed as Director of the School of Music, with Mrs. Nettie Thatcher Sloan, Annie Ione Mayer, Wilhelm Fogelberg, Joseph A. Smith, Jr., and Louie Eugenie Linnartz, as Instructors.

On September 1, 1904, Frank Russel Arnold, A. M., Bowdoin College, was elected Assistant Professor of Modern Languages; Niels M. Hansen, Jr., a former student of the College and a graduate of Harvard University, was employed as Instructor in Civil and Irrigation Engineering; Grace Fisher, B. S., Agricultural College of Utah, was employed as Instructor in History; Minnie Peterson, Inez Powell, and Gertrude Vibrans were employed as Assistants in the School of Domestic Science and Arts.

On September 10, 1904, James Dryden, who had been connected with the institution since 1892, first as Station Stenographer and Instructor in Stenography and Typewriting in the Commercial Department, and since 1902 as Assistant Professor of Meteorology and Poultry Husbandry, resigned his position to accept a professorship in the Agricultural College of Montana.

On October 1, 1904, Professor William Nicol Hutt,

who had been Professor of Horticulture and Botany since 1902, resigned his position to accept a professorship in the Agricultural College of Maryland.

On December 15, 1904, Robert S. Northrop, B. S., Michigan Agricultural College, an Instructor in Cornell University, was employed as Professor of Horticulture and Botany.

BUILDINGS AND IMPROVEMENTS.

The last Legislature appropriated \$17,000 for the construction of the poultry building and yards, the building for hogs, and extensions to the Mechanic Arts Building; and for completing the cattle and sheep barns, extending the water system, overhauling the steam heating plant, remodeling and finishing parts of the Main Building, installing a steam heating plant in the Dormitory, and constructing pasture fences and stock yards.

On account of the advance in prices of all kinds of building material and in the cost of labor, it was found impossible, for the amount appropriated, to complete the buildings as originally planned, and to make the other improvements contemplated. The plans were modified

Expenditure for Buildings. as far as possible, and yet, with one single exception, the cost of every building and improvement was greater than the estimate upon which the appropriation was based. According to the Secretary's Report, the aggregate cost of buildings and improvements was \$22,822, being \$5,822 in excess of the appropriation; and in order to keep the expenditures within this amount, it was necessary to omit the completion of the cattle and sheep barns and some other minor improvements. The amount in excess of the appropriation, of course, had to be drawn from the miscellaneous maintenance fund.

The poultry building and yards have been completed, with the exception of the cement basement and hallway, and the interior painting, at a cost of \$4,126. This struc-

The Poultry Building. ture is modern in every respect, and one of the best buildings of the kind in the country for educational and experimental purposes. It is 230 feet by 25 feet, with a two story office front 34 feet by 18 feet. The building is divided into a brooder section and an experimental section. Connected

with each pen is an outside yard 100 feet long. The building is heated by a hot water system. In the front part are an office, a feed room, a store room, and sleeping apartment. The basement, 18 feet by 34 feet, is used for a boiler room and for incubators. The building is used by the students in poultry husbandry, and for the work of the Experiment Station.

Hog Barn. The hog barn has been completed at a total cost of \$1,769. It is a wooden structure 65 feet by 31 feet, and contains, besides the feed rooms, a cook room, an abattoir room and twelve pens.

The additions to the Mechanic Arts Building include an engineering laboratory 50 feet by 31 feet, a motor room 19 feet by 20 feet, a foundry 36 feet by 36 feet, a carriage shop 36 feet by 36 feet, a coal bunker 35 feet by 12 feet, and an extension to the forge shop 46 feet by 36 feet, increasing the size of the forge shop to 118 feet by 36 feet. These extensions have made possible the introduction of foundry work and carriage building in the course in Mechanic Arts, besides providing additional room required by the large increase in the number of students in the Mechanic Arts Department. The total cost of the extensions to the shops was \$6,539.

Additions to Mechanic Arts Building. The basement of the south wing of the Main Building has been finished, providing the necessary rooms for the work in Geology and Mineralogy, including class room, geological and assaying laboratories and museum. A large room in this part of the building was also finished and equipped for the laundry work of the School of Domestic Science and Arts. The room that was formerly used as a laundry was provided with a large range and necessary desks for work in household science, thereby doubling the capacity of the kitchen laboratories. The south part of the Main Building, known as the "small chapel," or society hall, was remodeled, providing, on the first floor, an additional large room for sewing and a room for home nursing, and, on the second floor, a large additional room for the work in Engineering, and rooms for the physical laboratories. These improvements made possible a readjustment that has added greatly to the fa-

cilities for efficient work in a number of the different departments. The capacity of the draughting room was nearly doubled. The Department of Physics was moved from the old reading room on the first floor in the north wing of the Main Building to the rooms on the second floor in the south wing, where separate rooms were provided for class and laboratory work and the storage of apparatus. The rooms formerly used by the Department of Physics were converted into a museum and curator's room for the Department of Zoology and Entomology. This permitted the enlargement of the Zoological laboratories, resulting in a great improvement in the arrangements for the work of this important department. The Department of Geology and Mineralogy was moved from the top floor in the east central part of the Main Building to the basement rooms in the south wing, which are much more suitable for the work of this department, particularly for the laboratories and assaying furnaces. The rooms vacated by the Department of Geology and Mineralogy were converted into a laboratory and a class room for the Department of Horticulture, and the room formerly occupied by the Horticultural Department on the second floor of the north wing was converted into photographic rooms and a museum for the Department of Chemistry. These improvements, including plumbing and the changes necessary in the steam heating plant, but excluding general repair work throughout the building, cost \$4,530.

The steam heating plant has been installed in the Dormitory at a cost of about \$1,500. The first floor of the Dormitory has been remodeled, and other improvements have been made throughout the building, at an additional cost of \$800. The steam heating plant of the Main

**Further Im-
provements.** Building and the Mechanic Arts Building has been overhauled and improved, so that all parts of these buildings can now be kept at a uniform temperature. The water system has also been extended by putting a four-inch main through the Main Building, from which stand pipes extend to the different floors as a protection against loss by fire.

About \$25,000 has been expended during the two years for additional equipment. The Department of Agronomy has been furnished with a model threshing ma-

chine for use in station work, and with additional cases and incidental equipment for the museum and laboratory. The Department of Animal Industry has been provided with a number of the best breeds of pure bred live stock, besides additional equipment required in the dairy.

New Equipment. New Instruments have been purchased for the School of Music. The library has been furnished with a complete cataloguing outfit,

and about \$2,300 has been expended for books. Offices, with the most modern equipment, have been provided in the main accounting room of the School of Commerce. The necessary equipment has been added for the work in laundering, cooking, sewing, and home nursing. Important additions have also been made to the equipment of the different scientific laboratories and museums, and large quantities of machinery and other equipment have been installed in the forge shops, carriage shop, foundry, machine shops, and engineering laboratory.

In addition to the above, it has been necessary to construct a transformer house and install complete equipment for the distribution of light and power. Previous to this year, the Hercules Power Company, from which the College has been purchasing electric power and lights, has furnished the necessary sub-station equipment and distributing lines. In 1903, however, this company refused to continue the use of this equipment, and requested that the College either purchase or replace it at once. This involved a heavy expense which had not been anticipated in the request for appropriations from

Transformer House. the Legislature, and for which there was no money available. It was found impracticable to make any other arrangements by which

to avoid this outlay, and it was therefore necessary, since it is imperative that the institution have power and lights, to petition the State Board of Examiners to allow a deficit sufficient to cover this expense. Having secured the approval of the State Board of Examiners, the transformer house was constructed and the necessary equipment installed, at an aggregate cost of \$5,288. The building, 16 feet by 18 feet, is constructed of brick and stone, with cement floor. The equipment includes one 75 k. w. transformer, one 25 k. w.

transformer, one 20 k. w. transformer, with switch boards, meters, lightning arresters, and all accessories. This equipment, which is strictly modern in every respect, has been installed in such way that it is of service not only in the distribution of power and lights to the different College buildings, but also for the use of students in engineering work.

CHANGES IN COURSES.

On account of the establishment three years ago of the high school courses, distinctive of the work of the respective schools of the College, and of the differentiation

of the elementary from the College work, and General Statement. the revision of the courses generally, as ex- plained in the report for the last biennium,

very few changes have been made in the courses of study during the past two years. Some of the courses have been strengthened by a slight readjustment of work, and another year has been added to the course in Domestic Arts, extending that course from three to four years, and making the requirements for graduation from it the same as from the course in Mechanic Arts.

At a meeting of the Trustees, held in June, 1903, the School of Music was formally established. This school has since been organized with a Director and five instructors, and a course has been arranged in such way as to afford the students of the institution who are interested in music an opportunity to pursue work under specialists in both vocal and instrumental departments.

In 1903, with the permission of the Board of Trustees, the Faculty established a Summer School, with the understanding that the institution should bear no part of the expense of maintenance. It was the purpose of the Faculty in establishing this school to afford teachers of Summer School. the state in particular, and others who could not attend the College during the regular school period, an opportunity to avail themselves of the advantages offered by the institution for training along the different lines of Agriculture, Domestic Science and Arts, Commerce, and Mechanic Arts. In addition to these distinctive features, review courses were offered in

School of
Music Es-
tablished.

the different subjects of public school work, besides regular courses in pedagogy, English, mathematics, history, and the natural and physical sciences. While the attendance during the two summers has not been large, the work has been successful, and there is no reason why the school should not develop into a potent factor in extending the advantages of the institution to the people of the state.

STANDARD OF WORK.

On account of the various improvements made during the past few years, referred to in another part of this report, it has been possible to raise the standard of all the different courses. The work is now of such grade and quality as to place the College on a par with many of the older and larger land grant institutions of the country.

The College was very successful in its exhibit at the Louisiana Purchase Exposition at St. Louis. Through the efforts of the American Association of Agricultural Colleges and Experiment Stations, an appropriation of \$100,000 was secured from Congress to be expended under the direction of the Government officials

Louisiana Purchase Exposition. in defraying the expenses of an exhibit, "as a part of the Government exhibit," of the work of the land grant colleges of the United States. For this exhibit, the Agricultural College of Utah sent material from the School of Domestic Science and Arts and the School of Engineering and Mechanic Arts, and models showing the irrigation system of the Experiment Station and the summer vegetation house and equipment, used for check work on field experiments; also a machine invented by Dr. Yoder of the Department of Chemistry, for use in analyzing soils. All this work was considered by experts the equal of similar work exhibited by any of the other institutions, while that of the Department of Domestic Arts was pronounced superior to any other domestic arts

Medals Awarded. work in the exhibit. The irrigation model and the soil elutriator were each awarded a silver medal, the exhibit in Mechanic Arts received the "grand prize," and the exhibit in Domestic Arts was awarded a gold medal.

It is also a source of great satisfaction to note the extent to which the work of the College is accepted by other institutions. College graduates are now in attendance at Stanford University, Iowa College of Agriculture and

Recognition Among Colleges. Mechanic Arts, the University of Chicago, Cornell University, Columbia University, Harvard University, and the University of

Pennsylvania, all of which allow credit for the work completed at the College. A letter was recently received conveying the information that the degree of a graduate of the College had just been accepted in lieu of examinations for admission to graduate standing in the University of Chicago. Considering the comparatively meagre resources of the College, the sparsely settled country from which it draws support, and the brief period since its establishment, such recognition by the leading universities of the country is a tribute to the progressive spirit that has characterized the institution, and is ground for sincere congratulation to both the College and the state.

WHAT THE COLLEGE COMPRISES.

General Statement. The Agricultural College of Utah comprises the School of Agriculture, the School of Domestic Science and Arts, the School of Engineering and Mechanic Arts, the School of Commerce, the School of General Science, the School of Music, the Summer School, and the Agricultural Experiment Station.

The following courses are offered: Degree courses in Agriculture, Domestic Science, Engineering, Commerce, and General Science, each extending through four years; high school courses in Agriculture, Domestic Science, and Commerce, each extending through three years; manual training courses in Domestic Arts, Courses. and in Mechanic Arts, each extending through four years; winter courses in Agriculture, Domestic Arts, Mechanic Arts, and Commerce; a course in Music, extending through three years; a College Preparatory course, extending through two years; a Sub-preparatory course extending through one year; and courses in the Summer School.

The College Preparatory course is taken mostly by students who are preparing for admission to the Engineering courses. The Sub-preparatory course is maintained temporarily for the accommodation of persons of mature years who have been deprived of educational advantages and are unable to enter any of the more advanced courses.

THE SCHOOL OF AGRICULTURE.

The School of Agriculture comprises the departments of Agronomy, Horticulture, Animal Industry and includes such subjects as soils and farm crops, irrigation, Dairying, and Veterinary Science. The work in Agronomy includes such subjects as soils and farm crops, irrigation, farm drainage, buildings and fences, farm machinery, soil physics and rural economics. In Animal Industry a general introductory course is given in the selec-

Scope of the Work. tion, improvement and care of different kinds of livestock, followed by courses in dairying and poultry culture, and by more advanced

work in breeds of livestock, breeding and stock feeding. Four different courses are offered in Veterinary Science, including a free clinic, which is held every week during the winter term. The Department of Horticulture offers courses in the propagation and care of plants, orchard management, small fruit culture and vegetable gardening, floriculture, landscape gardening, and forestry.

It will be necessary to extend the work along certain lines of Agriculture during the next two years. Courses should be offered in agricultural mechanics, and additional courses provided for in horticulture. The importance to the state of Veterinary Science demands that more attention be given to this subject.

As explained elsewhere in this report, there has been a large increase in the enrollment of students in the agricultural courses during recent years, and a great improvement in the character of work done.

Growth. Much greater interest is taken in this work than ever before, and the prospects are that the increase in attendance during the next two years will be greater than during the past. This will increase the amount of instruction and make imperative the demand for more room and equipment.

The professors' reports, appended hereto, all emphasize the importance of extended facilities, and suggest the necessity for a new building adapted especially to the requirements of the different departments of Agricultural Agriculture. The Experiment Station is also Building. in need of additional room. It would be a great advantage if all the work in Agriculture, both instructional and experimental, could be brought together in one building sufficiently large to meet all the requirements for offices, class rooms, laboratories, museum, etc., and especially constructed for the particular work of the different departments. The Agricultural Hall, to meet the needs of the school for any length of time, would need to be very large and would probably cost at least \$100,000 to \$125,000. It may be practicable to plan the building in such a way that parts of it could be constructed at different times, thereby avoiding the necessity for the expenditure at once of so large an amount for one building. In planning College buildings, however, it is important that the requirements of the future be kept in mind, in order that expensive and wasteful modifications may be avoided.

Should the plans proposed later in this report be approved, it will be possible to make arrangements that will be fairly satisfactory to secure the additional room needed for the work in Agriculture during the next two years; but whatever provisions are made, they can be regarded at best as only temporary. A new Agricultural Building will certainly be required in the near future.

Further Needs. Professor Merrill reports that the Department of Agronomy will need \$1,350 for museum cases and supplies and the additional apparatus required for the soil physics laboratory.

It is estimated that the cost of completing the cattle and sheep barns, as explained by Professor Clark, and of providing the additional pure bred stock and other equipment required for the work in Animal Husbandry and Dairying, will be \$4,420. The cost of supplies for the Department, and of caring for the live stock, is estimated at \$8,970.

Five different professors have been in charge of the work in Horticulture at different times during the past

eight years. Such frequent changes have interfered more or less seriously with the work of the Department. The College has been most fortunate recently in securing the services of Professor Northrop, of Cornell University, whose training and experience warrant the belief that the Department will now be put on a more substantial

Horticulture basis, and that the horticultural interests of the state will receive the attention their importance demands. As explained by Professor Northrop in his report, the additional courses proposed, and the plans suggested for this work, will make it absolutely necessary that additional facilities be provided. However, while the courses are developing during the next year or two, arrangements can be made without much expense to meet the needs of the Department. The plan proposed of constructing a new green house and students' work room is entirely feasible, and is of such importance as to justify the most careful consideration. On account of the large amount of the professor's time required in experimental work, it will be necessary also to employ an assistant for the work in Horticulture and Botany.

Campus Improvement. With the amount of money available, it has been impossible during the past two years to make a number of improvements needed on the campus. Environment is an important factor in education, and it is desirable that the College surroundings be made as pleasant and beautiful as possible. The grounds should also be arranged and maintained in such condition that they will be of the greatest value to the students in landscape gardening, floriculture and forestry. It will be necessary to extend the lawns and construct drives east of the Main Building and north and east of the Mechanic Arts Buildings. The water pipes should also be extended to the new lawns. An appropriation, therefore, somewhat larger than usual will be required for campus work.

As shown in detail in Professor Northrop's report, the Department of Horticulture and Botany, including the campus, will require during the next two years, for equipment, \$1,000; for green house with potting shed, or students' work room, \$3,500; supplies, labor, and team work, \$4,550.

On account of the additional work required in Agronomy, Professor Merrill was relieved, two years ago, of the work in Veterinary Science, which was, thereupon, transferred to the Department of Animal Industry, in charge of Professor Clark. The instructional and experimental work in Animal Industry and Dairying is such that it requires all the time of one professor and his assistants. As Professor Clark suggests in his report, it is therefore impossible for him to do justice to the work in Veterinary Science. There is a large increase each year in the number of students in this subject. There is also a great demand throughout the state for the services of a veterinarian to assist in the control of contagious diseases affecting livestock. A Professor of Veterinary Science in the College could also act as State Veterinarian, and by dividing his time between the two offices his work could be made of inestimable value in promoting the livestock interests of the state.

THE SCHOOL OF DOMESTIC SCIENCE AND ARTS.

The importance of special training for women, adapted to their particular sphere of life, has been recognized in the College from the time of its establishment.

Historical. When the institution was first opened, a course was offered in Domestic Arts, consisting of three subjects, cooking, sewing and dairying. The growth of the Department was such that the work was finally segregated, and departments were established in Domestic Science and in Domestic Arts. These departments were more recently organized into the School of Domestic Science and Arts, offering work in twenty-three different subjects.

Manual Training Course. The Manual Training course of four years is adapted especially to women who can spend but a short time in school, and who desire to emphasize the work pertaining to the every-day duties of home life. The course is essentially practical. The distinctive features include such work as laundering, cooking, fruit work, foods, sanitation and hygiene, hand and machine sewing, designing, cutting

and fitting, and dressmaking. In addition to the special work, the student acquires a good general education.

The High School course admits students who have had better preparation, and who desire to devote more time to general educational work. The distinctive work is similar to that of the Manual Training course, less time being given to practice work, with additional work in home nursing and personal hygiene. More attention is given to nutrition, the composition of foods, and the underlying principles of the practice work.

The College course includes the general subjects usually given in courses in liberal arts in higher institutions of learning, and such courses in chemistry of foods, bacteriology, cooking, hygiene and sanitation, and household economics, as are of greatest value to the skilled housekeeper. The course is also well adapted to persons who desire to teach Domestic Science and Arts.

The work of the School of Domestic Science and Arts has grown in popularity and thoroughness each year. The improvements recently made in the laundry, cooking laboratories, and sewing rooms, have added to the efficiency of the work. The courses are gradually being improved, and excellent work is being done.

Notwithstanding all the additions that have been made during the past few years to the room and equipment for the work of this school, the large attendance and the great increase in the demand for advanced work, justify the plea of the head of the Department for enlarged and more suitable quarters. The growth of the School is indicated by the following statement of attendance, as shown in the Registrar's report: in 1900-1901 the number of students registered in this School was 62; in 1901-1902, 88; in 1902-1903, 117; in 1903-1904, 149. The registration at present is 126, while large numbers of additional students will enter after the holiday vacation. The large increase in the amount of work done in the School is indicated by the fact that the total number of class units in the different subjects for the year 1903-1904 was 295, while the number of class units on December 7th of the present year was 371. The number entering in January

Growth of
the School.

will, undoubtedly, bring these figures considerably above 400.

The increase in the amount of work and in the number of students registered in the different courses will make it necessary that additional instructors be employed in this School. Additional rooms are

Needs of the School. also needed, particularly for the work in household science. Moreover, the rooms used

at present for this work, in the basement of the Main Building, are of necessity poorly ventilated, besides being inadequate and in some respects unsuitable for the work. The construction of a Women's Building, arranged to accommodate all of the distinctive work of the women students, as suggested by Professor Cotev,

would no doubt be an ideal plan. Indeed such a building is badly needed even at present, and should be provided as soon as practicable.

Women's Building. There are more pressing demands, however, of other departments, and in view of the recognized impossibility of the State's providing sufficient money at one time to meet all of the needs of the institution for buildings, it would seem necessary for the present to make other arrangements for the work of this school. Besides the additional instructing force required during the next two years, the equipment needed will cost \$1,260, while \$2,225 will be needed for labor, and for miscellaneous supplies, including those for the cooking classes.

THE SCHOOL OF COMMERCE.

The Agricultural College of Utah is one of the few institutions of higher learning in the United States that have made Commerce co-ordinate with other courses

Scope of the Work. leading to degrees. The School of Commerce in this institution comprises the departments of Political Economy, Political Science, and

Accounting. Twenty-nine different courses are offered, including the subjects of economics, banking, finance, industry, commerce and transportation, commercial and international law, bookkeeping, stenography and typewriting.

In the three year course, the student may emphasize

the work in bookkeeping and accounting, or in stenography, receiving a certificate upon the completion of the course. In the general work of this course, special attention is given to English and history.

In the four year degree course, the students are allowed to specialize in production and manufacture, commerce and transportation, banking and finance, or accounting and auditing. Paralleling the distinctive work of the course are strong courses in English and modern languages, besides general courses in science and history. Intercommunication work has been established with some of the largest commercial schools of the country. The purpose of the advanced course is to give students a good general education, and to prepare them for positions of leadership and responsibility in large business enterprises.

There has been a gradual growth in the School of Commerce, the increase in attendance during the past four years being 150 per cent. During the last year and

Growth. a half, the work of the School has been more fully systematized and considerably strengthened.

Good discipline prevails and thoroughness and efficiency characterize the work of the different departments. Aside from an additional assistant required in typewriting, the present instructing force will be able to do the work of this School. As estimated by Professor Bexell, the equipment and supplies required during the next two years will cost \$1,020.

Needs. In addition to the regular class work in the Department of Political Science and Industry, considerable has been done during the past year in making collections of material for an Industrial Museum. This involves practically no expense, except for cases, and will add greatly to the value of the courses given in Industry. The necessary expenses for this work during the two years will not exceed \$200.

THE SCHOOL OF ENGINEERING AND MECHANIC ARTS.

One of the greatest demands of the State and adjacent country is for men who have received the special

*Political
Science and
Industry.*

training required for the solution of problems encountered in the engineering projects peculiar to this intermountain region. Skilled engineers are required in designing and constructing water systems, power plants, irrigation systems, bridges and railroads, machinery of different kinds, large buildings required for offices and manufacturing purposes, and so on. In shops and mills everywhere the demand is for the educated mechanic as well as for the skilled artisan.

Scope of the Work. It is the purpose of the School of Engineering and Mechanic Arts to meet these demands. The School comprises the different

departments of Engineering and the Department of Mechanic Arts. Twenty-four different courses are offered in Engineering, among which are such subjects as hydraulics, including the construction of water power plants, irrigation systems, etc.; power development; power transmission; mechanism and machine design; municipal engineering, including road building, water supply and sewerage; resistance and elasticity of materials; field work in land, railroad and hydrographic surveying; heating and ventilation of buildings; draughting room work; and masonry structures.

The course in Mechanic Arts includes a fairly good high school training in English, mathematics, history, drawing, and science, in addition to the technical work. The student is required to work fifteen hours a week in the shops. After the beginning course in carpentry is completed, he may follow the special line in which he is most interested. The work comprises twenty-four different courses:—carpentry, including house building, cabinet work, wood turning, pattern making, and sloyd; forge work, moulding and foundry work; carriage building; and machine work in metal.

Needs of the School. The attendance in the different courses of this school is rapidly increasing; and notwithstanding the large additions that have been

made during recent years to the buildings and equipment, the School is still in need of additional machines for the shops, and of large extensions to its laboratory equipment. As President Perrine of the Stanley Electric Manufacturing Company says:

“The educated engineer is not merely the builder of

railroads and of bridges along lines laid down by others, but is one capable of grasping fundamental principles. He is one who plans and works out schemes, and who foresees the bearing of the undertaking upon those with whom the completed project comes in closest touch. In so far as our education may comprise only the study of what is to be done and the ways of doing it laid down by other men, it is only a training in a path that circles round and round."

There is no part of the United States in which there is a greater demand than in Utah and adjoining country for engineers who are capable of "grasping fundamental principles," who have initiative, who are able to adapt themselves to entirely new conditions.

For the School of Engineering and Mechanic Arts of the Agricultural College to afford the students in en-

Laboratory Equipment. gineering the training required in getting a thorough understanding of the Engineering courses as usually given, and in preparing to

surmount the difficulties encountered in the large engineering projects peculiar to the intermountain country, including the development of hydraulic systems, both for power and for irrigation purposes, it is imperative that the most modern and complete laboratory equipment be provided. Such equipment should include the necessary machinery and appliances for all kinds of testing, such as mechanical power and efficiency testing; steam, electrical and hydraulic testing; and the testing of different kinds of materials used in construction work. The material testing laboratory is provided with a number of very valuable machines, but requires some additional equipment.

The most urgent need of the School at this time is a Hyradulic Laboratory. The location of the College is such that an ideal Hydraulic Laboratory can be con-

Hydraulic Laboratory. structed at a comparatively small cost. As explained by Prof. Jenson in his report, water can be obtained from the canal of the Logan and Smithfield Canal Company and conveyed

through pipes to the College, a distance of 7,000 feet, with a fall of 250 feet. The construction of this pipe line would give sufficient pressure to force water to the upper floors of the College buildings for use in laboratory

and other work, and to afford the necessary protection in case of fire. By constructing the laboratory building at the foot of the terrace, near the Canyon road, a few hundred feet south of the Mechanic Arts Building, sufficient power would be obtained for all the purposes of the Hydraulic Laboratory and Power Plant. Aside from the superior educational advantages this plant would afford, it would be of great value to the institution in providing power and electric lights, thereby saving from \$1,500 to \$2,000 a year. As the institution grows, more power and more lights will be required, with a proportionate increase in the amount annually saved.

It is estimated that the entire cost of the plant, including the pipe line, building, and hydraulic equipment, would not exceed \$22,500, and that an additional \$10,000 would cover the cost of all the equipment required for power development. Assurances have been received that a title to the land required for the site will be conveyed to the institution without cost.

The importance to the College of this improvement, in providing (1) an ideal laboratory, (2) an electric plant, and (3) an improved water system, with sufficient pressure for use in case of fire, can hardly be overestimated.

The additional pressing needs of the School at this time, as estimated by the professors, include:

Additional Needs.	Equipment for the mechanical testing laboratory	\$ 2,000
	Current and pressure meters and gages, including a Ven- turi meter	800
	For laboratory purposes, including me- chanical appliances, current convert- ers, portable meters, etc.	10,000
	Machinery for the shops	5,250
		\$18,050
	Supplies for two years, for Engineering..	1,000
	Supplies for the two years, for Mechanic Arts	7,800
		8,800

On account of the large increase in the work of the School, it will be necessary to employ an additional instructor in Engineering; two additional assistants dur-

ing the first year, and three during the second year, in Mechanic Arts.

THE SCHOOL OF GENERAL SCIENCE.

The School of General Science is the logical outgrowth of the demands of the technical schools, and comprises all of the general, or non-technical, departments of the institution.

The schools of Agriculture and Domestic Science and Arts demand strong courses in the natural sciences; and the work in Engineering and Mechanic Arts rests

Origin of the School. fundamentally on advanced mathematics and physics; while all the courses, including those in Commerce, require efficient work in English, history and modern languages. Hence a

complete modern equipment and a competent faculty are necessary in the different departments of chemistry, geology, zoology, mathematics, physics, modern languages, history and English. It is possible, therefore, with practically no additional expense, to offer an advanced college course in which exceptional opportunities are afforded for specialization in any of these departments.

There are always a number of students who have a special aptitude in certain lines of study apart from the technical courses. The General Science Course gives such students a broad educational training, and prepares them for important positions as specialists in different industries or in the educational profession. It is also well adapted to persons who desire to prepare for the professions of medicine and law.

The growth of the departments of science, mathematics, language, and history has been such that there is

General Requirements. a general demand from all these departments for more instructors, additional class or laboratory rooms, and, in the science departments, for large additions to the equipment.

Large additions to the library are also needed, particularly by the departments of language, history, and mathematics. There has been a large increase in the enrollment in all the departments and the work generally has been very satisfactory. Detailed information concerning the departments will be found in the professor's reports.

The Department of Chemistry has had the greatest growth in the matter of enrollment and has been most embarrassed for want of adequate laboratory room and equipment for the accommodation of the large number of students in the different courses. Aside from the possible cost of remodeling the rooms on the third floor of the north wing of the Main Building for the elementary courses in Chemistry, the requirements of the Department for the next two years are, for equipment, \$3,995; for supplies, \$1,255.

The Department of Zoology and Entomology will need additional assistance for museum, laboratory, and class work. The cost of the additional equipment required is estimated at \$1,080; of supplies, \$380.

Zoology and Entomology. The work in Geology and Mineralogy has been very much improved by the removal of the Department to the rooms provided for it in the south basement, as explained under "Buildings and Improvements." Considerable remains to be done in getting the material for the museum properly classified and arranged in cases. The supplies, museum cases and other equipment required will cost \$1,404.

Geology and Mineralogy. The rooms used by the Department of Physics are far superior to the ones previously occupied, but the Department is greatly in need of large additions to its equipment. Considering the importance of Physics in all the engineering and other technical courses, *Physics.* this Department is the least adequately equipped department in the institution. For it, at least \$2,500 should be expended during the next two years.

Mathematics and Astronomy. With one exception, the Department of Mathematics and Astronomy has the largest department enrollment in the College. One professor, one assistant professor, and two instructors have charge of the classes, the instructors devoting part of their time to other work. Two additional rooms, and one additional instructor will be required next year. The Department also needs a set of mathematical models that will cost about \$600.

The enrollment in the Department of English Lan-

guage and Literature exceeds that of any other department. The instructing staff consists of the Professor and four instructors.

English Language and Literature. The large increase in the work of this Department makes it necessary to employ an additional instructor and an assistant during the next biennium. In addition to the regular work, the Department has rendered valuable assistance to the students in their literary and dramatic efforts, in connection with the publication of "Student Life," and the presentation of such productions as Shakespeare's "Midsummer Night's Dream" and "As You Like It."

In the Department of Modern Languages, three courses have been given in German, two in French, one in Spanish, and two in Latin. Special emphasis is placed on the modern language work, because of its importance in the commercial, scientific, and technical courses. The increase in the amount of work required during the next two years will make it necessary to arrange for an instructor to take at least two or three of the courses.

The increase in the amount of work required in the Department of History and Economics has made it necessary to employ an instructor who has given three-fifths time to the Department. The full time of the Professor and an instructor will be required after the present year.

History and Economics. Since all the students in the different schools of the College are required to take work in the Department of Drawing for at least one year, the large increase in the number of students enrolled for the work of Drawing. this Department has been such during the past year and a half that the present rooms and instructing force are entirely inadequate. The work has to be arranged so as to meet the special needs of the different classes of students in science, Agriculture, Domestic Science and Arts, etc., and of necessity is largely individual, requiring an exceptionally large amount of time on the part of the instructor. Seven different sections are necessary, requiring 35 hours a week of the instructor's time in actual class work. This is at least two-fifths more work than should be attempted by one instructor. One to three additional sections will be re-

quired during the next two years, and it is necessary that another instructor be employed. The only feasible plan by which to obtain the additional room required will be to finish the fourth floor west of the stairway in the Main Building, as explained by Mr. Stutterd in his report. By placing windows in the roof, the rooms would be ideal for the art work, and would be large enough to meet the needs of the Department for a number of years. The architect's estimate of the cost of completing the rooms and providing stairways leading from the third to the fourth floor is \$2,970. In addition, the Department will require about \$400 for equipment.

THE SCHOOL OF MUSIC.

In the School of Music, four different courses are offered, each extending through four years and leading to a certificate of graduation, as follows: Piano Course,

**Scope
and
Success.** Vocal Course, Violin and Violincello Course, and Composition Course. The work of the

School is in charge of a Director and five instructors, who depend for their compensation upon tuition fees received from individual students, except that the Director is paid by the College for training the College Choir, Military Band, and Orchestra. The instruction in these organizations is free to all students of the College. At present the Choir has a membership of fifty, the Orchestra of fifteen, and the Military Band of thirty-four. The Choir furnishes music for Chapel exercises, and is preparing an Opera and Oratorio which will be rendered during the present year. The Orchestra furnishes dance music for the dancing matinees at the College, and will play accompaniments to the Opera and Oratorio. The Military Band furnishes music as occasion requires in connection with the work of the Military Department, and frequently appears in public in the interests of the College. It affords students an exceptional opportunity for training without personal expense, on the different band instruments. It has given one concert this year, rendering music of a high grade in a most satisfactory manner, especially in view of the fact that a number of the members had been in training less than two months. The Mandolin and Guitar Club meets

regularly for practice and the work of this organization affords a most happy diversion for its members. Already this year, 158 students are enrolled in the different courses in Music.

While the School of Music is maintained at comparatively small cost to the College, it is of great value in providing the students of the technical schools who have musical tastes, an opportunity to receive musical training along with their regular College work. Others, who are primarily interested in Music, can get the work they desire in this School, and, at the same time, enjoy the advantages afforded by the institution for other work in which they may have interest.

For additional band instruments, an appropriation of \$600 will be needed; while \$300 should be available for supplies and the care of pianos.

MILITARY SCIENCE AND TACTICS.

The enrollment to date this year in the Department of Military Science and Tactics is 196. The Cadets are organized into a battalion of three companies, with a band of thirty-four members and an artillery detachment. The work is planned in accordance with the regulations prescribed by the U. S. War Department, and is very successful considering the unfavorable conditions under which it has to be done.

The Morrill Act of 1862, providing for the establishment of land grant colleges, makes it mandatory that provisions be made for work in Military Science and Tactics,

Need of Room. but prohibits the use of any of the Government funds for the maintenance of the Military Department. As explained by Com-

mandant Styer in his report, the room in the basement in the front part of the Main Building, used as a drill hall, besides being in many ways unsuitable for the work, is large enough for the accommodation of only 80 cadets. The regulations of the War Department require that at least 100 cadets shall be in regular training, or the Government will not detail an officer for the work.

The Government Inspector in his report to the War Department has repeatedly urged the necessity of an armory for the military work of the College. During the

past year several communications were received in which it was claimed that the instructions of the War Department were not being complied with. In a communication from the Assistant Adjutant General, under date of July 26, 1904, is the following statement:

"I am directed by the Acting Chief of Staff to invite your attention to the fact that the spirit of General Orders, No. 65, April 6, 1904, War Department, publishing the laws and regulations governing details from the Army to educational institutions, has not been complied with at the Agricultural College of Utah, as shown by the report of the recent inspection of that institution, and to inform you that the War Department insists upon a full compliance with the regulations above mentioned."

It is impossible to comply with the "spirit of General Orders, No. 65," under present conditions. With an enrollment in this Department of 196, fewer than half of the cadets can be accommodated in the drill room, and the cold inclement weather renders outdoor work impossible during the winter months.

It was urged in the Biennial Report of the President four years ago, and again two years ago, that an Armory

New Armory and Gymnasium. should be provided for the work in Military Science and Tactics; but on account of the other pressing demands for additional room,

it was found necessary to use the money available for buildings in providing for the work in other departments. The growth of the institution, and the resultant increase in the number of cadets, together with the demands of the Government officials, make it absolutely imperative that an Armory be provided without further delay.

Without large additional cost, the building for an Armory could be constructed in such a way as to make it available also for the work in physical education, the importance of which is discussed in another part of this report. It is strongly urged, therefore, that an appropriation be requested from the Legislature to construct and equip a building suitable for use as an Armory and Gymnasium.

For meeting the expenses of the annual encampment and providing miscellaneous and incidental equipment and supplies for the next two years, \$600 will be required.

PHYSICAL EDUCATION.

The work that has been attempted during the past two years in physical training and athletics is explained in the appended reports of Miss Moench and Professor Campbell. As stated in the President's report four years ago, and repeated in his last biennial report, "The importance of physical

**Value
of
Physical
Training.**

education in all institutions of learning is recognized throughout the educational world.

No institution is regarded complete without ample provision for the proper symmetrical physical development of its students. It is not enough that provision be made for desultory physical exercise, or that students devote a certain length of time each day to particular kinds of manual labor. To produce the desired results, the growing student should receive regular scientific physical training under the direction of a specialist in his line of work."

A strong healthy body is a fundamental requisite to success. More than seventy per cent of the students of the College come from the families of farmers, laborers, and mechanics, and have been accustomed in most cases to hard manual labor. They enter upon their courses of study with the same energy and enthusiasm that have characterized their efforts at home. The sudden change from vigorous manual effort to work requiring the closest mental application, and from free out-door life to the confinement of the recitation room, laboratory, and study, without provision being made for regular systematic physical exercise, not only produces a consequent incompleteness of development, but often results in permanent injury to health.

The demands of the technical schools of the College for additional room have resulted in the postponement of arrangements for work in Physical Education, until the

**Physical
Training
in Other
Colleges.**

interests of the entire student body demand that adequate and immediate provision be made for this feature of their training. As stated by Professor Campbell in his report, there is scarcely a college or university in the land that does not make provisions for gymnasium work, while most institutions require a certain number of hours

a week of regular work in physical training. For example, the University of California prescribes for both men and women three hours a week through two years; the University of Wisconsin, four hours a week during two years. Each of these institutions has a men's gymnasium and a women's gymnasium, separate buildings for the work of the men and women.

Ex-President Adams of the University of Wisconsin, speaking of the gymnasium work of that institution, says:

"The popularity of the work is shown by the fact that the average amount of exercise taken by students in the University is somewhat more than twice the amount actually required. Student life has come to be a very different thing in consequence of this work. It affords a clean and wholesome place for an abundance of physical exercise, and serves very greatly to check those tendencies to an excessive exuberance of animal spirits which in former times so often manifested themselves in exhibitions of lawlessness and disorder. In the women's gymnasium the requirements are essentially the same. The benefits derived by the young women from this systematic work are no less marked than those derived by the young men."

President Stone of Purdue University, in urging the importance of a new gymnasium, makes this statement:

"The student must apply himself for many hours daily at the desk or in the laboratory; his hours of relaxation are short, and to meet these unusual conditions provisions should be made. What would not be needed in the home life becomes imperative under these new conditions. Regular and systematic exercise, available at times when his schedule permits; healthy and sanitary physical conditions of living; and opportunity for relaxation in vigorous but innocent ways, the student must have in order to maintain his body and mind in a healthy and efficient condition. To meet this need, there should be on the campus and as a part of the University equipment, a commodious, well-furnished, modern gymnasium, with abundant provision for every student for exercise

and for bathing, and all should be in charge of a competent instructor."

Considerable progress has been made in the development of athletics in the College. Although football has perhaps been the most popular game, basket-ball, baseball, tennis, and different kinds of track athletics.

Athletics. athletics, have also received attention. While it is necessary to keep athletics under control that they may not be carried to excess, yet when properly regulated they become a most potent factor for good in the life of any educational institution. To quote from Professor Campbell's report:

"It should be borne in mind that much of the value of our contests for physical supremacy is in the consequent development of the moral qualities involved. On the part of the contestants, arise obedience to voluntarily imposed discipline, sacrifice of immediate pleasure for a worthy end, concentration of attention on the want of the moment, and the breadth and strength of character that comes through responsibility well carried. On the part of the student body, come pride in their college, enthusiasm in a common cause which results, as no other college experience can, in a spirit of true comradeship, and finally the training in a sane attitude toward success or defeat. These are of vital and primary importance in getting the full value out of our athletic games."

President Jesse of the University of Missouri, in speaking of the athletics of that institution, says:

"A spirit of fairness, truthfulness, constancy under defeat, generosity to the vanquished, politeness to opponents even under provoking circumstances, and love of sports, for their own sake, has taken possession of the students. You are spending a large amount of money for this service, but you are thereby helping to make your students manly men and womanly women in things physical and also in things social and moral. Contests between class teams have awakened this year great interest here, which is a good sign. The foundation for the new Gymnasium for men will probably be laid during the

coming summer. A large number of athletic fields for the various classes have been set apart."

An ideal plan in providing to meet the needs of the students of the Agricultural College of Utah for physical training, would be to have an Armory and Gymnasium for men, with offices, class rooms, measuring rooms, dressing rooms, lockers, ample bathing facilities, and complete modern equipment; and a Women's Building containing a Gymnasium for women, with complete modern equipment, including dressing rooms, lockers, and bathing facilities.

**New
Armory
and
Gymnasium.**

As it is impracticable to procure money for both of these buildings at this time, the best plan would be to construct an Armory and Gymnasium, arranged in such a way that temporarily it could be used for the work of both men and women. On account of the large space required for the drill hall and the necessity of providing rooms for the Commandant's Office and for the equipment of the Military Department, such a building will necessarily be somewhat larger and correspondingly more expensive than would be required for gymnasium purposes only. The cost of an Armory and Gymnasium, with equipment, is estimated at \$60,000.

THE LIBRARY.

The report of the Librarian shows that during the period from July 1, 1903, to November 5, 1904, 1,559 bound volumes and 1,549 pamphlets have been added to the Library, making a total of 3,108 accessions. Of the bound volumes, 869 were purchased and 690 were gifts.

During this period a number of important improvements have been made in the Library. The books have all been classified according to the Dewey Decimal System, and an alphabetical card catalogue for about 9,000 volumes has been completed. It is expected that the remainder of the books will be catalogued by the close of

**Library
Improve-
ments.** the present year. A shelf list on cards has also been prepared, forming a classed catalogue for official use. Duplicate books, magazines, and pamphlets are catalogued separately, and, as opportunity is afforded, are exchanged for du-

plicates of other libraries. The adoption of the open shelf system, allowing students free access to the books, has made the Library of much greater value to the students. This system has not resulted in any loss of books, but has been a great convenience to students and a saving of the time of the attendant.

**Library
Course.**

A course of library work has recently been established for the accommodation of students who desire to prepare for positions in libraries. A class has been formed in the course this year, and very satisfactory work is being done.

To provide for the additional books received, it will be necessary during the two years to add four steel stacks to the Stack Room, and eighteen feet of wall stacks for reference books in the Reading Room. New furniture has never been provided for the Reading Room. The tables and chairs now in use were procured for the Library a great many years ago, and are not suitable for present use. A number of the departments throughout the institution are in need of additional tables and chairs,

**Needs
of the
Library.**

and those now in the Reading Room could be used in meeting this demand. A complete equipment of reading tables, chairs, magazine racks and slopes for newspapers, in harmony with the other equipment of the Library, should be provided. If possible, there should also be a cork carpet for the Reading Room, as explained by the Librarian. A cabinet for maps, binders for periodicals, and other miscellaneous equipment will also be needed. For this equipment, including steel stacks, tables, slopes, chairs, magazine racks, filing cases, etc., \$2,797.50 will be required. In addition to this, at least \$2,500 a year should be available for the purchase of books for the different departments, and for binding and subscriptions to periodicals.

AGRICULTURAL EXPERIMENT STATION.

A brief summary of the work accomplished by the Agricultural Experiment Station during the past two years will be found in the appended report of the Di-

rector. Detailed statements of the work are published in the thirteenth and fourteenth Annual Reports of the

Scope. Station, which are attached hereto and form a part of this report. The Station at present comprises the departments of Agronomy, Animal Husbandry, Horticulture, Chemistry, Irrigation, Poultry Husbandry, and Entomology. Each department is making certain special investigations; while a number of the departments do co-operative work covering a broader field.

In several of the departments the work of the Station has been notably successful. The irrigation work has received the highest commendation of Government Officials

Irrigation Work. and has attracted the attention of irrigation students generally. Recognizing the success of the Utah Station in irrigation work,

the U. S. Irrigation Investigations of the Department of Agriculture contributed \$2,400 last year for irrigation work in Utah in co-operation with the Station; and proposes to furnish \$5,000 for this work during each of the next two years, on condition that the State furnish an additional \$5,000 a year. The Department of Agriculture has also furnished upwards of \$1,000 during the past year for co-operative work with the Station for the purpose of testing the different varieties of sugar beet seed,

Other Investigations. and of developing varieties superior to those now in use. Co-operative work with the Department is also in progress for the purpose of determining the extent to which alkali land may be reclaimed.

Animal Husbandry and Horticulture are important agricultural industries of the state, and it is expected that hereafter more attention can be given to the Station work along these lines than has heretofore been practicable.

Among the greatest needs of the Station may be mentioned the necessity for more land, and funds with which to publish the results of the investigations. A tract of land has been leased for a term of years, with the option of purchase at any time during the period of

Needs of the Station. the lease, or at the time of its expiration. Since this lease does not terminate during the next biennium, the appropriation for the purchase of land will not need to be made until the next session of the Legislature. For publishing the bulletins, however, it is estimated that an appropriation of \$2,000 a year will be required.

It is impossible to estimate accurately the financial value of the work of the Station in promoting the development of the agricultural interests of the State. From computations made, however, it is evident that, should the farmers of the State follow the directions given in the bulletins as a result of the work already accomplished, there would be an annual gain of hundreds of thousands of dollars.

ARID FARMS.

The Report of the Arid Farm Investigations, which were made in different counties of the state, in accordance with the provisions of the law passed by the last Legislature, and for which an appropriation of \$12,500 was made, is now in press, and will be printed in time for binding with this report. In it detailed information will be found regarding the location of the Arid Farms, the assistance rendered by the different counties in furnishing the land and clearing, plowing, and fencing the same; and the results already accomplished.

Work Done. In experimental work, it is impossible in one or two years to get data from which reliable conclusions can be reached. It is necessary, therefore, that the work of the Arid Farms be continued, for which an appropriation of \$15,000 will be required for the two years, or \$2,500 for each farm.

FARMERS' INSTITUTES.

In the appended report will be found a statement of the Farmers' Institutes held during the period from July 1, 1903, to December 3, 1904, showing that 96 different meetings were held, with an approximate total attendance of 15,000 and an approximate average attendance of 162. The distance traveled by Institute speakers from the College was about 6,500 miles. Two Farmers' Institute Annuals, Numbers 6 and 7, have been published

Extent of the Work.

since July, 1903, in editions of 6,000 copies each, and have been distributed among the farmers of the State.

As the people become better acquainted with the work, there is an increasing interest manifest in the Institutes, and more requests for meetings are received from different parts of the state. It is impracticable for the College employees to devote a large part of their time to Institute work; and with the amount of means available, special Institute lecturers cannot be employed. It is therefore impossible to hold Institutes in all of the counties of the State each year. That as much as possi-

General Plans. ble may be accomplished, a definite plan has been adopted whereby one county is to be visited only once a year and a County Institute held, instead of attempting to hold meetings in different districts. Local and county committees are expected to arrange the details, secure local speakers, and advertise the meetings. From two to four speakers are sent from the College to attend each Institute. The results of this arrangement have thus far been very satisfactory. There is much greater interest in the work, and a much larger attendance.

Meetings for Women. Recently the plan has been followed of arranging for special meetings for women in connection with the regular Farmers' Institutes. At these meetings, lectures are delivered by representatives of the School of Domestic Science and Arts of the College, and by other speakers, on subjects relating to the interests of the home. This plan has been very successful, and it is proposed that it be continued.

Future Needs. The work of the Farmers' Institutes should be enlarged. Compiled information from the Station bulletins and other publications should be published in popular form for general distribution. The establishment of local Institutes should be encouraged, and they should be provided with outlines of courses of study that would be of assistance to them in pursuing systematic work. In other words, the Farmers' Institutes should be organized and conducted in such way as to supply the needs of the people for college extension work along the different lines of Agriculture and Domestic Science and Arts. Many of

the people of the state whose circumstances are such that they are deprived of the advantages of college training, if given intelligent direction and assistance, would pursue systematic courses of reading that would be of inestimable value to them. To do this work the appropriation for Farmers' Institutes should be increased to at least \$3,000 a year.

FINANCIAL.

In the report of the Secretary will be found in detail an account of the receipts and expenditures of the College for the two years, January 1, 1903, to December 31, 1904. From this report it will be seen that there are three principal sources of income:—

I. Grants by Congress of the United States:

- Sources
of
Income. 1. The Morrill Grant of 1890 for instructional purposes.
- 2. The Hatch Act of 1887 making appropriations for agricultural experimental work.
- 3. Land Grant of 1862, available on admission of Utah to statehood.

II. The Utah State Legislature.

III. Fees of Students, miscellaneous sales, etc.

The income and expenditures for the two years, as shown by the report, are as follows:—

From U. S. Government:

For instructional purposes,	
Act of 1890	\$ 62,164.43
For instructional purposes,	
Act of 1862	11,877.34
For experimental purposes,	
Act of 1887	30,000.00 \$104,041.77

From State Legislature:

For buildings, improvements, equipment, and maintenance	123,447.18
For Arid Farm investigations	12,500.00
For Farmers' Institutes	2,795.82 138,743.00

Receipts	Fees of students	9,550.40
	Sales, departments of instruction	6,058.61
	Sales, Experiment Station	2,908.50
	Sales, Arid Farms	170.79
	Sales, Bookstore	7,931.09
	Dormitory Rental	419.50
		<hr/>
	Grand Total	269,823.66

Expenditures.	For buildings, improvements, and general maintenance	204,654.64
	Farmers' Institutes ...	2,877.95
	Arid Farm investigations	13,150.09
	Experiment Station	32,254.05
		<hr/>
		252,936.73

The amount shown as having been received from the Government for instructional purposes, includes the balance on hand January 1, 1903, \$12,164.43; and the amount received from bookstore sales cannot be regarded as a resource, as there would be an approximate corresponding expenditure for bookstore merchandise.

The following summary of the inventory of College property is taken from the Secretary's Report:

Value of College Property.	Real Estate	\$ 14,500.00
	Buildings	276,263.53
	Equipment	84,281.13
	Bookstore merchandise on hand	2,220.99
		\$377,265.65

To this should be added the amount of the Land Grant Fund	166,307.10
Total value of College property	\$543,572.75

From the report of the Secretary of the State Board of Land Commissioners, dated December 8, 1904, is obtained the following information regarding the Agricultural College lands and Land Grant Fund:

Lands patented to the State for the Agricultural College of Utah	146,099.43	acres.
Number of acres sold .	119,615.19	acres.
Total value of land sold \$	166,307.10	
College Lands. Amount of principal invested, with rate of interest	62,600.53	at 5 per cent.
Amount of deferred payments, with rate of interest	103,719.72	at 5 per cent.
Amount of land leased	24,827.41	acres.

The Secretary reports the following expenditures for permanent improvements during the past four calendar years:

Addi- tions to Equip- ment.	Buildings	\$ 78,034.46
	Permanent improve- ments	13,610.78
	Additions to equipment	35,354.40 \$126,999.64

The following abstract of the Secretary's reports shows the income of the College from the date of its establishment to December 30, 1904:—

I. From U. S. Government:

Morrill Act of 1862 ...	\$ 24,425.40
Hatch Act of 1887 ...	227,500.00
Morrill Act of 1890 ...	345,000.00 \$ 596,925.40

II. From Utah Legislature:

For buildings, im- provements, and maintenance	\$521,023.79
For Experiment Sta- tion	13,588.39
For farmers' institutes	11,284.15 \$ 545,896.33

III. From Miscellaneous Sources:

Fees and miscellane- ous sales	\$102,647.14 \$ 102,647.14
Grand total.....	\$1,245,468.87

The distribution of the income for instructional and experimental purposes is as follows:—

I. For Instructional Purposes:

From U. S. Gov't....	\$369,425.40
From Utah Legislat'r.	532,307.94
From miscellaneous	
sources	70,932.38 \$ 972,665.72

II. For Experimental Purposes:

From U. S. Govern-	
ment	\$227,500.00
From Utah Legisla-	
ture	13,588.39
From miscellaneous	
sources	31,714.76 \$ 272,803.15

Grand total.....\$1,245,468.87

In considering the cost of instruction in the College, it is important to keep in mind the fact that the work of land grant colleges is the most expensive kind of educational work.

From the records of the offices of the Registrar and the Secretary, careful computations have been made showing the student registration by departments for the year 1903-1904, with the approximate cost per unit of registration in each department. A unit of registration is one hour of the student's time at the College weekly during one-half year, in lecture or in recitation, together with the time necessary in preparation therefor; or a longer period in shop, laboratory, field, or other exercises not requiring preparation. The cost is based upon the amount expended for salaries and other incidental expenses, but not including permanent equipment. This investigation shows that the cost of instruction in English was \$4,755 for 5,245 units of registration, or 92 cents per unit; and that the cost of instruction in each of the departments of Mathematics, History and Economics, Political Science, and Modern Languages, was between \$1.12 and \$1.66. In sharp contrast with this stands the instruction in Botany, Chemistry, Geology and Mineralogy, Physics, Zoology and Entomology, each of which cost per unit be-

Cost of
Instruction.

tween \$5.02 and \$6.82. The most expensive instruction was in the technical departments, in which the cost per unit was as follows: in Mechanic Arts, \$6.52; in Engineering, \$9.09; and in Agriculture, \$9.25 to \$10.06.

A similar investigation was made by the Recorder of the University of California for the year 1899-1900. From the President's Report for that year, is obtained the information that the cost per unit of registration in the departments of English, Modern and Ancient Languages, Mathematics, History, and Political Science, ranged from \$1.94 to \$2.86, while such subjects as Chemistry, Botany, Zoology, Geology and Mineralogy, ranged from \$4.76 to \$7.33. In Mechanics the cost per unit was \$16.80; in Engineering, \$7.95 to \$12.16; and in Agriculture, \$11.95. The difference in the cost per unit in the same departments of the University of California and the Agricultural College of Utah is due mostly, if not entirely, to the higher salaries paid the instructors in the former institution.

The nature of the technical work is also such that very much more room and equipment are required than for general educational courses, with a corresponding increase in the cost of maintenance.

REQUIREMENTS.

The following estimates of the requirements of the Agricultural College of Utah for the next biennium have been reduced to the lowest possible amount consistent with thorough and efficient work. To insure efficiency there must be ample room, adequate equipment, and a strong, competent faculty. Every room in all the buildings is now in use, and yet more class rooms and laboratories are required. As shown in the department reports, additional instructors and assistants are needed, and the demand everywhere throughout the institution is for more equipment.

BUILDINGS.

The cost of providing an additional conservatory, with potting shed, or students' workroom, required by the Department of Horticulture and Botany, will be	3,500.00
The Armory and Gymnasium, required for the work in Military Science and Tactics and in Physical Education, will cost, for building and equipment	60,000.00
The Hydraulic Laboratory and Power Plant, including the construction of the building and pipe line; the hydraulic equipment, and equipment for power development, will cost.	32,500.00
	96,000.00

IMPROVEMENTS.

The cost of completing the cattle and sheep barns, and constructing the necessary paddocks and yards, will be	2,600.00
The cost of finishing the fourth floor in the new front of the Main Building, required by the Department of Industrial Art, will be	2,970.00
The cost of providing an additional boiler, and of making other necessary improvements in the heating plant; extending the water system as a protection against loss by fire, and extending the sewer system, as explained in the report of the Superintendent of Buildings, will be	3,195.00
	8,765.00

EQUIPMENT.

Laboratory and miscellaneous equipment for the Department of Chemistry	3,800.00
Desks and equipment for elementary and advanced laboratories of the Department of Physics	2,500.00
Equipment for material testing laboratory	2,000.00
Meters, instruments, and general equipment for the Department of Civil Engineering . . .	1,200.00
Museum and laboratory equipment for the Department of Agronomy	1,000.00
Pure bred stock, and miscellaneous equipment for the Department of Animal Husbandry and Dairying	1,350.00
Tables, chairs, reading slopes, magazine racks, filing cabinets, steel stacks and other equipment for the Library and Reading Room	2,350.00
Shop and Engineering Laboratory equipment	10,000.00
Laboratory and museum equipment for the Department of Zoology and Entomology . . .	1,080.00
Books, magazines and periodicals required by the different departments of instruction . . .	4,000.00
Equipment for the Departments of Horticulture, Mineralogy and Geology, Mathematics and Astronomy, School of Commerce and School of Domestic Science and Arts	10,350.00
	39,630.00

MAINTENANCE.

Insurance - on buildings and equipment	2,500.00
For general maintenance, including salaries, janitorial services, fuel, electric light and power, night watchman, postage and stationery, printing and advertising, maintenance of farm buildings and care of live stock, maintenance of Station Building, painting and repairs, care of grounds, maintenance of steam heating plant and water system, miscellaneous department and general supplies, and other general and incidental expenses	225,795.00
	228,295.00

Less:

Amount received from U. S.	
Government	50,000.00
Interest on Land Grant Fund.	15,000.00
Fees and department sales ..	16,000.00
Salaries paid from Experiment Station fund	13,500.00
	94,500.00
Balance	133,795.00
Experiment Station, for printing	4,000.00

RECAPITULATION.

Total appropriation required:

For general maintenance ...	133,795.00
For equipment	39,630.00
For printing, Experiment Station	4,000.00
For improvements	8,765.00
For buildings	96,000.00
	282,190.00

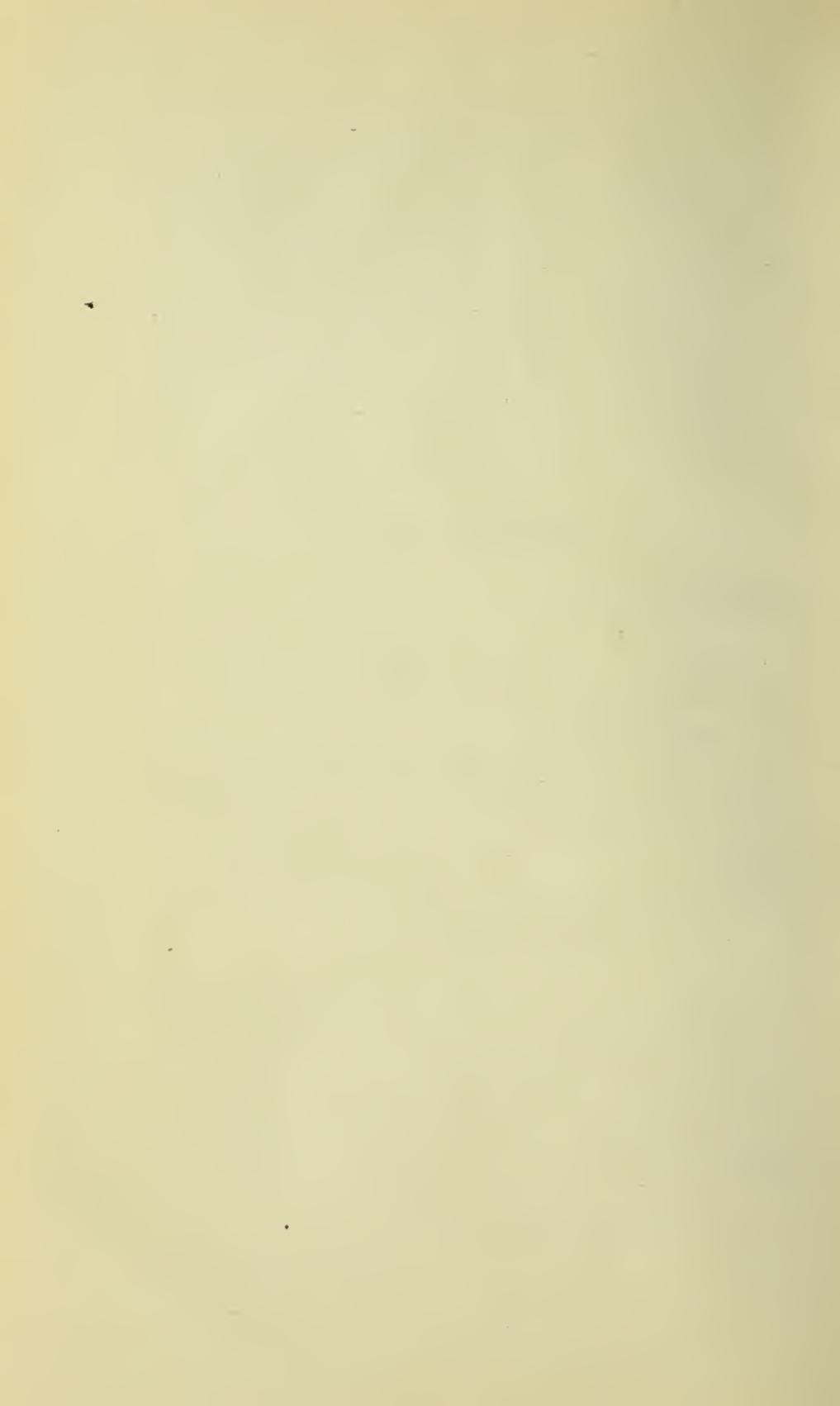
Respectfully submitted,

W. J. KERR, President.

January 5, 1905.

APPENDICES.

- (1) Professors' Reports.
- (2) Report of Director of Experiment Station.
- (3) Report of Farmers' Institutes.
- (4) Registrar's Report.
- (5) Report of Superintendent of Buildings.
- (6) Secretary's Report.



The School of Agriculture.

DEPARTMENT OF AGRONOMY.

To the President of the College,

Sir:—The work of the Department has been carried on during the past two years under more favorable conditions than heretofore, and the great increase in the enrollment is an indication of healthy development. There seems to be no reason why this increase should not continue.

The work in Agronomy falls naturally into three subdivisions: first, the regular College course; second, the High School course; third, the Winter courses. Under the College courses, five regular courses in Agronomy are offered, these being of the same relative grade as the other technical courses of the College. Two of these courses are required of all Agricultural students, and the other three are required of students selecting Agronomy as a major, these being optional to students in Horticulture and Animal Industry.

The High School course in Agriculture embraces three terms' work in Agronomy, given during the first and last years of the course. Two special courses of lectures are given by the Department through January, in the Winter Course in Agriculture. The School of Agriculture has made excellent growth during the past two years, in the number and quality of students enrolled, as well as in the equipment and facilities for work. The education of the farmers and of the farmers' sons is an important mission; and the growing appreciation of the work of the School by the people of the state, as well as by our own students and faculty, is extremely gratifying.

Utah is a great agricultural state, and the School of Agriculture is doing much toward developing respect for this industry, and intelligence in its pursuit. The stu-

dents registered in the Agricultural Course will compare favorably in scholarship with those in any of the other schools of the College, and the well-known ability of many of these students has done much towards winning respect for our work. This year we have students registered from other schools of the College, from the University of Utah, and from many of the Church and High Schools throughout the state. These students are much better prepared for the work than were the students who came to us a few years ago, and thus the quality and standard of the work is gradually improving. It is especially gratifying that the agricultural work has attracted the favorable attention of most of the recent graduates of the institution, and it is to their efforts, very largely, that our steady growth is due.

Four rooms, situated in the basement of the north wing, are used by this department. These rooms were assigned to us as temporary quarters at a time when there were few students registering in the course. Considering the importance of the courses in Agronomy in an agricultural college, it would seem a good policy to have the Department located in attractive and convenient rooms. Very little equipment has been added to the Soil Physics laboratory during the past two years. Two museum cases of excellent design were purchased for the Museum, and by exchanging an old case, unsuited for our purposes, for one of similar design to the two purchased, we have now three splendid cases in which to exhibit sheaf grain, grasses, etc.

Requirements. It is probable that no additional courses will be offered by this department during the next two years. From the present enrollment, the classes in Agronomy 2 and Agronomy 3 will be much larger hereafter; in which event additional laboratory equipment for the work in Soil Physics will be necessary, as the character of the work is such as to preclude any arrangement by which two students can use the same apparatus. We also need for this laboratory a machine for the mechanical analysis of soils. The additional apparatus needed will cost \$600. New museum cases will need to be provided, and a sum set apart for traveling expenses, freight, etc., for the collection of soils, grasses, etc., from over the state. A good Agricul-

tural Museum is an absolute necessity, as it is only by this method that valuable educational material can be placed before the classes in an acceptable form during the winter months; at least \$750 should be set aside for the museum work.

Two sections are provided in Agronomy 1 this year, and I believe two sections will accommodate the students registering in this course in the next two years. If all the courses in Agronomy, now offered, are called for next year, (as now seems probable), fifteen hours of instructional work will be required during the first term, and nine hours during the second term.

Before we can hope to make the instruction in Agricultural Mechanics successful, a laboratory and equipment will have to be provided, and until this laboratory can be permanently installed in a new building, I do not think it wise to recommend its establishment.

New Agricultural Building. It seems to me that the agricultural work in this institution has now assumed such proportions as to make desirable a permanent home for the Agricultural School. The present arrangement, whereby the chairman of the Agricultural Committee finds it necessary to consult with students in a small office used by the Station Agronomist, the Assistant, and Farm Foreman, is far from satisfactory.

The Agricultural departments are located on different floors and so widely separated that consultation between the instructors rarely occurs. I find, too, that having an office in the Station Building, I am unable to come in close contact with agricultural students, and I am convinced that the office of the chairman of the School Committee should be easily accessible to the students.

There should be provisions made for the Agricultural Club. There is no larger, more enthusiastic organization in the College than the Agricultural Club, and a room should be provided for their use.

The Department, then, urgently needs a new building to contain lecture and class rooms, museum and exhibition rooms, laboratories, storage rooms, and offices for head of the Department, the Assistant, and the clerical help. There is a very favorable sentiment throughout the state regarding our agricultural work. In recogni-

tion of this increased interest, I believe that a strong effort should be made to unify the work in Agriculture, to increase the teaching force, and to give the school a permanent, respectable home.

I have not investigated the cost of such a building, but I believe that we should not be eclipsed by the surrounding states. I am informed by the Professor of Agriculture in the Idaho State University that they will ask this year for an Agricultural Building to cost not less than \$60,000. Colorado already has a separate building devoted to agriculture; certainly Utah cannot afford to neglect this proper encouragement to her first and most important industry. Surely the time is at hand when a school so important should have permanent and proper provision for its efficient development. I hesitate to suggest any remedy in case the building cannot be provided, because the necessity of the building is so urgent. At all cost, the work of the School of Agriculture should be brought together.

Respectfully submitted,
LEWIS A. MERRILL,
Professor of Agronomy.

DEPARTMENT OF ANIMAL INDUSTRY.

To the President of the College,

Historical. Sir:—The Department of Animal Industry, along with other departments, has made material growth during the past two years.

The attendance of classes has been increased, making in one instance their division into sections necessary. With the new barns, pure bred stock, improvements in the creamery, and other general equipment, greater interest is being taken by students in the work, with a consequent increase in the quality of the work done.

Scope of the Work. The instruction given in Animal Husbandry consists of stock judging; a study of the different breeds of live stock, including origin, development, effect of climate, management, etc.; breeding of live stock, dealing with the laws of production, as heredity, variation, correlation,

cross-breeding, in-breeding, etc.; feeding and management. The course is so given that the knowledge acquired in the class room can be put into practical use on the farm.

The work in Poultry Culture includes a study in breeds and breeding, feeding and management, buildings, incubation, diseases, etc. This course is given to all first year students in Agriculture. There are now about forty regular students registered in this subject. Poultry growing is rapidly becoming one of the leading industries of the United States. Utah does not produce eggs enough to supply her own market. Large shipments are made into the state every year. The industry needs stimulating.

The instruction in Poultry Culture has been given heretofore by Professor Dryden, but on account of his severing his connections with the institution, it has been looked after of late by the writer. The work in Dairy Husbandry consists of the study of the composition of milk; milk-testing; butter making; cheese making; testing for adulterations; organizations, building, equipment and management of home dairies and creameries. Realizing that dairying is the most profitable line of agriculture in Utah, and that there is a strong demand for trained men in this work, special emphasis is laid upon it.

Veterinary Science. The Veterinary Science work was transferred to this department two years ago. Owing to the work of the Department proper, the courses in Veterinary Science have not secured the attention they deserve. All regular students in Agriculture receive instruction in Veterinary Science three times a week—besides clinical work on Mondays,—during the second term of the third year of the three year course. The aim of this course is to teach the student how to take care of sick animals and how to diagnose and treat ailments common to farm animals, as colic, milk fever, distemper, sweeny, lameness, etc. A careful study is made of contagious diseases and their control. Veterinary Anatomy and Medicine is offered to Agricultural students in the Junior and Senior years.

Provisions should be made by the state for securing the services of a Veterinarian. The state has reached a point where the services of one are indispensable. The

control of contagious diseases affecting live stock should be closely looked after. Some of the state laws relating to such matters at the present time are of no value, because of the want of properly trained authority to enforce them. As an instructor in Veterinary Science in the Agricultural College, as a state officer working in co-operation with the State Board of Health, and as a member of the Experiment Station staff, the services of a Veterinarian would be inestimable to the state.

Requirements. As to the buildings, the Department is in need of much. The cattle and sheep barns are not finished, and the Creamery is in a cramped

condition. I hope consideration will be given to the erection of a building, where the various offices, laboratories, etc., of the Agricultural School may be brought together, and where the Creamery, with all modern facilities, may be located. A class room for judging live stock should be located in this building. The work in stock judging must now necessarily be given out of doors, on account of the large size of the classes. During inclement, cold weather, the student's health is endangered and the quality of the instruction is lowered. Good class work cannot be done under such circumstances.

More fencing, charts, maps, and lantern slides are needed; also herd books of the different breeds of horses, cattle, sheep and swine. The cattle barn erected several years ago should be completed and filled with live stock. Several thousands of dollars are now invested in buildings that bring no return. With the completion of the cattle barn and with more animals, instruction and experimentation would be greatly strengthened. As the enrollment in the Dairy courses increases, more milk will be needed for the Creamery. On account of the high prices paid for milk by the Cache Valley Condensers, the time is near at hand when the College will have to produce all of the milk required for class practice. The institution purchased three pure bred dairy cows, and three heifers three years ago; but as more or less of the increase are males, building up a herd is a slow process. In view of these facts I recommend that five Holstein cows and one bull be purchased. The institution owns a few Shorthorns and Herefords, but they cannot be depended on for milk. They are used in demonstrating beef

form to students, and are most valuable for this purpose.

A few Berkshire pigs should be purchased for both experimental and instructional purposes. The office of the Professor of Animal Industry should be connected by telephone with the cattle barns and with the offices of the President and Director.

<u>Summary of Equipment Needed.</u>	Finishing east wing of cattle barn ..	\$1,600.00
	Ceiling cattle and sheep barns.....	700.00
	Completing bull paddocks	200.00
	Building boar yards	200.00
	Charts, maps, lantern slides, etc....	150.00
Pure bred Berkshire swine		120.00
Pure bred Holstein cows		750.00
One pure bred Holstein bull		250.00
Telephone		100.00
Equipment for Creamery		350.00
 Total		 \$4,420.00
 <u>Summary of Supplies Needed.</u>	Salary for live stock assistants.....	\$2,400.00
	Feed for stock	2,500.00
	Veterinary Science	100.00
Incidental expenses, as halters, regis- tration of live stock, building re- pairs, etc.		600.00
Supplies for Creamery, including \$3,000 for pur- chase of milk		3,370.00
 Total		 \$8,967.00

Respectfully submitted,
 R. W. CLARK,
 Professor of Animal Industry.

DEPARTMENT OF HORTICULTURE AND BOTANY.

To the President of the College,

Sir:—Having had charge of the Department of Horticulture and Botany but a very short time, it is with much difficulty that I prepare this report. In fact, my con-

nection with the College and Station has been so limited that I must necessarily base my recommendations for the next two years largely upon the expenditures of the last fiscal year, making careful allowance for the growth and development of the College in general.

In an institution of this nature, the matter of careful training along practical and scientific lines should receive first attention. With this thought in mind, I will outline the work of the past and accompany it with a few suggestions concerning my wishes for the future.

Heretofore there have been given seven courses in Horticulture:—1, Propagation and Care of Plants; 2, Pomology; 3, Olericulture; 4, Floriculture; 5, Home Floriculture; 6, Forestry; 7, Landscape Gardening; also two courses in Botany:—1, Structural and Systematic Botany; 2, Physiological Botany.

It is probable that, in the younger days of the institution, these courses were ample, but considering the present flourishing condition of the College and the later development of horticultural science, it is my judgment that the lines of work offered students should be broadened, enabling advanced students to carry on investigation work, which would be of great assistance to them in solving many problems, in case they become actively engaged in horticulture.

With this object in mind, I will offer for your consideration the following revised arrangements of courses for the coming year:—1, Handicraft; 2, Propagation and Care of Plants; 3, Olericulture; 4, Greenhouse Management and Construction; 5, Home Floriculture; 6, Pomology; 7, Spraying and Spraying Mixtures; 8, Landscape Gardening; 9, Forestry; 10, Plant Breeding; 11, Plant Evolution; 12, Investigation.

Botany being the foundation for all work with plants, it seems essential that the courses in this subject be rearranged and revised with some additions, not only to give the student a better foundation on which to base his study of agronomy and horticulture, but to raise the standard of work given in this school to that given in other similar institutions.

The following courses are suggested:—1, Systematic

and Morphological Botany; 2, Plant Histology; 3, Plant Physiology; 4 Plant Pathology.

Requirements. It is evident that these new courses will considerably increase the number of students in the Department. This will require much more instruction than one man can possibly attend to, making necessary the services of a laboratory assistant. Greenhouse space and facilities for student work will be decidedly inadequate. Even at present the Department is seriously hampered by lack of room in which to grow the ordinary forced and florist's crops which are essential to class work of this nature.

I would therefore strongly urge the necessity of a new building with sufficient room set aside for Horticulture laboratory work. This building should be so placed that the several greenhouses which the work demands could be in close connection with the rooms devoted to Horticulture. Following is a summary of the rooms required and the use to which they would be put:—1, Class room for lectures, recitations, etc.; 2, Propagation laboratory, with tile floor, containing work tables with drawers for apparatus, such as knives, flower pots, seed pans, etc., thus enabling us to hold each student accountable for property intrusted to his care; 3, Pomology laboratory, containing tables and sinks, with cabinets or cases around the room in which to keep fruit models and preserved specimens; 4, Spraying laboratory, with tiled walls and floor, wherein the spraying mixtures can be mixed.

As this work in Horticulture necessitates soiled hands and clothing, the use of a locker room containing lockers for aprons, jackets, etc., is at once apparent. I would therefore suggest that arrangements be made to this effect.

In case the desired Agricultural Building is not to be obtained for two or more years, I would suggest the following alternative merely as a temporary makeshift. I believe that by doing this the Department can handle the work for a year or two while the courses are developing.

The green-house now in use is an iron-framed structure of a pattern still being erected by the builders. They are easily taken down and erected at a nominal cost.

If one more house of the same size and pattern were secured and erected at the east of the house we now have, they could both be removed to their permanent location after the Agricultural Building is secured.

For a student work room, the present Veterinary Hospital, which is seldom used, could be removed to the east of the present potting shed, and the new green-house connected with it. I find by measuring the hospital and the land east of the conservatory, that this plan is entirely feasible and could be carried out at a comparatively small expense.

Outside of the Department is another matter which needs attention. The campus is badly in need of improvement. There should be considerable shrubbery planted in various places, some new lawn areas prepared, and some drives altered and repaired.

With these suggestions I will submit an estimate of the probable expenditure required by the Department for the next two years.

Horticulture	Laboratory equipment	\$ 500.00
	Laboratory supplies	100.00
Botany.	Laboratory equipment	300.00
	Laboratory supplies	50.00
Campus.	Labor	2,400.00
	Foreman's salary (two-thirds)	800.00
	Team Work	700.00
Shrubbery and Ornamental plants	.....	200.00
Green-house plants, seeds and supplies	300.00
Equipment	200.00
Green-house, with potting shed	3,500.00
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Total	\$9,050.00

Respectfully submitted,

ROBT. S. NORTHRUP,
Professor of Horticulture and Botany.

School of Domestic Science and Arts.

To the President of the College,

Sir:—I hereby present my report of the School of Domestic Science and Arts since September, 1902.

There have been a few changes made that have strengthened and improved the courses. The Manual Training course has been lengthened from three years to four. This is a marked advance, as it was not desirable to make any one course shorter than other similar courses. It now gives a certificate after three years of work above the eighth grade. Two essential subjects—English 5 and Physiology—have been added. Only a little more technical work has been added, as the course was too crowded before.

The work of students has, on the whole, been most satisfactory. Each year sees an improvement in the quality of work done by students in the lecture work in Domestic Science, denoting better preparation. More students with advanced standing have entered during the past year than during any previous year of my connection with the institution. Courses are gradually being strengthened, and excellent work is done along all lines.

The room for Home Nursing and its furnishings will be a great aid to the class work, increasing the efficiency of the instruction and the interest of the pupils. The laboratory table and equipment are also valuable aids to class work. The extra kitchen and new laundry and equipment add greatly to convenience, and enable us better to meet the constantly increasing demand for instruction in practical cooking. The large Sewing room recently fitted up enables the classes to work without the uncomfortable crowding before experienced.

If possible, Mathematics 3 and 4 should hereafter be given in consecutive years and not separated as at present. It is not advisable that young women be required to take Mathematics taught for the benefit of Engineering students. I would therefore suggest that a modified course in Mathematics 4 be arranged for students in Domestic Science. It would be very desirable to give more time to Household Science 8; also to Household Science 9 and 11. The Department work during the next two years will amount to: fifteen courses in Domestic Science a year,—an average of forty-five hours of class work each week; twelve courses in Domestic Arts a year,—averaging seventy hours of class work each week.

Women's Building. I firmly believe the size and importance of the School of Domestic Science and Arts warrants us in asking for more room and better quarters. Our work is too badly scattered, and the basement rooms are ill-lighted and poorly ventilated. We are seriously in need of a Women's Building, large enough to provide for all the different lines of Domestic Science and Arts, with rooms opening together to form a banquet hall large enough to accommodate the visiting crowds who expect to be entertained with the famous Cooking Class dinners. There should also be a lunch room, reception rooms and dressing rooms for the women. A Women's Gymnasium and baths should certainly be a part of this building. \$40,000, I believe, would build and equip an up-to-date structure of this kind. If the building is not obtainable, we will make the best of present quarters, and ask for the room adjoining basement room to use as a store room, or for cupboards placed in the passage to the laundry.

Equipment. In view of the large companies we are called upon to entertain at lunch, I recommend the purchase of dishes enough to set tables for 300 guests. Rent on dishes is one cent each, and this would pay for the dishes in after years, besides saving many dollars in help to wash and handle them. There is also the consideration of convenience. Our supplies of silver, linen and china need partial renewing during the next two years. Added equipment is needed in the Sewing Room. An allowance is needed for

Museum. More books and periodicals are needed in the Library on our lines of work. A new floor should be placed in the kitchen, and the dining-room floor dressed.

Summary of
Require-
ments for
Next two
Years.

Labor	\$ 300.00
Laundry	125.00
Equipment for Domestic Science...	785.00
Equipment for Domestic Arts.....	475.00
Repairs and changes	250.00
Supplies for Cooking classes	875.00
Miscellaneous supplies	675.00
 Total	 \$3,485.00

Respectfully submitted,

DALINDA COTEY,
Professor of Domestic Science.

School of Commerce.

To the President of the College,

Sir:—The School of Commerce is larger at present than at any corresponding date in its history. At no time has it had a “phenomenal increase,” but every year has given a very satisfactory addition to its enrollment. This strengthens my faith in the conservative policy which has generally obtained in the Department, and leads me to believe that changes should be made slowly and gradually.

Scope of the Work. The School of Commerce aims to furnish preparation for two fields in the commercial world, that of the office employee and that of the business manager. The one must deal largely with facilities or skill of handling the routine office work; the other must train the mind for the broader, more far-reaching activities of business life. Two courses are offered: one of three years, leading to a certificate of graduation; and one of six years, leading to the degree of Bachelor of Science in Commerce. Students are generally enthusiastic and are doing excellent work in all the classes. The best possible discipline prevails, and the attendance and promptness of the students could hardly be improved.

Historical. The following changes of courses went into effect at the opening of the present school year. The elective courses known as Seminars; together with the courses in Clearing Houses, Financial Centers, Telegraphy, and Graham Stenography, have been discontinued. The courses in Commercial Law are all given during the second year, and a course in Civil Government is given in the first year. Accounting and Administration has been condensed into five instead of nine courses. Winter courses in Accounting, Penmanship, and Commercial Law have been added.

The Accounting room has been quipped with a splendid set of office fixtures, and actual business practice is now conducted in the following lines of business: banking, transportation, real estate, commission, retailing, and wholesaling. Inter-communication work is now being carried on with some of the leading schools of the United States, and an effort is being made to open correspondence with the commercial universities of Paris and Leipzig, so as to give students in German and French an opportunity to use those languages. Important additions have been made to the equipment of the offices; loose leaf and card ledgers, and up-to-date filing devices have been introduced at a small cost to the Department —thanks to the liberality of the publishers and dealers. Some attention has been given to the establishment of an Industrial Museum and valuable contributions have already been received. The collection can be increased rapidly, and with little cost to the Department, as soon as suitable filing cases are provided. All the rooms occupied by the Department have been greatly beautified by a large number of framed pictures, maps, and charts donated by various commercial institutions.

Changes in Courses. But few changes in courses are contemplated at this time. Instruction will be given in Civil Service next year, but will require no additional time. Mathematics 4 should change places with Banking and Finance 1 and 2, so as to bring Mathematics 3 and 4 into consecutive years. With the present attendance, it will be necessary to maintain two sections in Accounting 1, two in Stenography 1, two in Typewriting, and four in Penmanship. All other courses will be given in one section each.

The following courses will be offered: Political Economy, fourteen courses; Political Science, four; Accounting and Administration, five; Stenography, two; Typewriting, two; and Penmanship, two.

Requirements. No additional instructors will be needed with the present attendance, except an assistant to take charge of Typewriting 1. A student can be secured to do this work at twenty cents an hour.

As suggested in former reports, Political Science and Stenography should change rooms. Under present con-

ditions, students lose much time and create considerable disturbance in passing from the dictation room to the typewriting room. This could be avoided by cutting a door between rooms 114 and 112. The new room should then be equipped with tables instead of settees. If the Library is refurnished, the old tables can be used for this purpose. Room 114 would make an excellent room for the industrial museum, and I would recommend that suitable cases and equipment be provided and the change made before the opening of the next school year.

The Library should receive an addition of at least \$300 worth of books, periodicals, etc., on commercial subjects. Only about \$75 has been expended during the past two years for that purpose.

The following is an estimate of expenditures during the next two years:

	Equipment for Museum	\$ 200.00
Equipments.	Typewriters; new, exchanged and re-	
	paired	450.00
	Filing cases for Typewriter room...	50.00
	Stationary, ink wells, etc., for individual desks.	30.00
	Tables for Stenography room	75.00
	Change in rooms 114 and 112	40.00
	Miscellaneous supplies	175.00

	Total	\$1,020.00

Respectfully submitted,

J. A. BEXELL,
Professor of Commerce.

DEPARTMENT OF POLITICAL SCIENCE AND INDUSTRY.

To the President of the College,

Sir:—The Department of Political Science and Industry forms part of the School of Commerce, and has enjoyed the same degree of progress and prosperity that has characterized the latter during the past two years. There has been a very perceptible increase of interest, on the part of the students, in all these courses.

Historical.

As an aid in Political Science work, a good beginning has been made toward the establishment of a working library in the class room. Both students and instructor contribute to it all articles and court decisions of interest that can be found, and these, properly catalogued, are of easy access at any moment they may be needed in the class work. Besides, the class room becomes a sort of study and home for students, and a certain pride is taken in the collection which they have helped to make.

Civil Government has been made a prescribed study this year for the first time. Constitutional Law is an elective study, but is being given on petition of the students.

In the work in Industry and Commerce a similar interest is taken; and a museum of object lesson materials is being collected. About one hundred and fifty letters are being sent to the manufacturing and commercial establishments all over the country, asking for contributions of materials in different stages of manufacture, and data or matter descriptive of the various factories. We already have some returns and hope to receive favorable replies from almost all. The Museum will cost the College nothing, and will be of inestimable value in class work. There is scarcely a product of any consequence, but what can be shown in several stages of its production or manufacture; and the value of such methods needs no argument among educators.

Industry is pre-eminently a live subject, and can be successfully taught only by means of magazines, newspaper clippings, materials, etc., in connection with the text. There are at present only meagre and temporary quarters for a working library and museum, but an expenditure of probably \$200 would prepare room 114 suitably for such purpose. This arrangement would leave 112 available for the Department of Stenography.

During the past year, through the kindness of Professor Bexell, six large pictures and one map, all framed and under glass, have been placed on the walls of the Department.

Respectfully submitted,

E. W. ROBINSON,
Professor of Political Science and Industry.

School of Engineering and Mechanic Arts.

To the President of the College,

Historical. Sir:—During the past two years the School of Engineering and Mechanic Arts has been materially strengthened in the matter of room and equipment. The rooms in the main building used for Mechanical Drawing and Descriptive Geometry have been enlarged and improved. The Forge Room has been extended, giving an additional floor area of approximately 4,000 square feet. For the Engineering Department, a room for a Testing Laboratory, containing a floor area of nearly 1,500 square feet, has been provided. The Motor Room adjacent to the Forge Room has been rebuilt, providing room and light for working purposes. In connection with the Forge Room extension, a new coal cellar with a capacity of about sixty tons has been built.

The extra room thus provided has been equipped with appropriate apparatus, not only affording opportunity for handling larger classes, but also enabling the School to broaden and extend the scope of its field of instruction. Thus, to the Department of Mechanic Arts has been added two new shops; namely, the Iron and Brass Foundry, and the Carriage Shop. Chief among new features in the Engineering Department is the Testing Laboratory, where students may study the behavior of the various materials with which the engineer has to deal, under the actual conditions which lead to safety or failure in construction.

The chief equipment added during the past two years may be listed as follows:

Engineering.

1	Riehle universal testing machine, capacity 200,000 lbs.
1	Riehle cement testing machine.
1	15 horse-power gasoline engine for experimental and driving purposes in Testing Laboratory.

- 1 Engineer's transit with solar attachment.
- 1 Engineer's Y Level.
- 1 Engineer's compass.
- Stadia, leveling rods, etc.

Mechanic Arts.

- 1 Power hammer.
- 1 Iron melting cupola with blast system and equipment for practical work in foundry.
- 1 Brass melting furnace with suitable crucibles and tongs.
- 1 15 horse-power motor for driving new apparatus in Forge Shops.
- 8 Power blast forges and anvils, with complete tool equipment.
- 1 Set of carriage building tools.
- 6 Wood turning lathes.
- 1 Engine lathe.
- 1 Crank Shaper.
- 12 new sets carpenter's tools
- New benches for Forge Shops, Carpenter Shops, and Machine Shops.
- Minor pieces of apparatus, such as vises, cabinets, shafts, pulleys, hangers, etc.

To this should be added a considerable amount of equipment in the way of office furniture, including a large roll top desk; a supply of tools for the Forge Shop; bookcases, tables, all new benches for all the shops, etc.; provided by the Department without extra cost for equipment, the expense being the cost of material as provided by the supply fund.

There should also be mentioned in connection with the improved facilities for work, the installation of a new substation, with its switchboard and full complement of meters for the measurement and observation of electrical power used by the College. It has been the plan in installing all this equipment to purchase standard up-to-date apparatus, so that the processes carried on here may fairly represent the processes of the manufacturing world. In this particular, we differ somewhat from other schools, where the apparatus is purchased with reference to the school work especially, and many pieces are pur-

chased which are built for "Manual Training Schools" rather than for regular manufacturing purposes. It has also been the aim to place all apparatus in such a way that it may be used, not only for the immediate work in one particular department but for general laboratory work for the College.

Recently arrangements have been made *Wider Field.* to co-operate more directly with the important engineering work of the State, by having

practical engineers lecture before our students upon problems of their profession, the College in turn offering to make laboratory tests so far as the present equipment will permit. In view of the increased public attention growing out of this plan, it is incumbent upon the School to fulfill conscientiously the highest expectations of its patronage. In order to meet these requirements, it is necessary to have at the head of each department a man with a broad and accurate knowledge of engineering science, an appreciative knowledge of up-to-date engineering practice, a recognized teaching ability, and an energetic spirit of self-helpfulness. The work must be broad and comprehensive, so that graduates may not only be engineers; but may stand in the front rank of citizenship, and have such ideals and ambitions and influence in their communities as should characterize educated men.

These conditions further require that a broad field of engineering subjects be available, not only that the student may have greater freedom of selection, but that he may be properly impressed with the broad scope of activity which an engineering training opens up. Laboratory facilities must be afforded, to assist in making the abstract as concrete as possible; to place in the hands of students empirical data which concern local conditions and can be had in no other way; and to afford the student practice in the manipulation of apparatus and material. A well equipped laboratory will afford a much-desired opportunity to the engineering profession, to make our school headquarters for making tests of the properties of material and apparatus with which they may be concerned, and also for data obtained by the College which may be safely used in engineering practice.

It is very important, then, that the equipment of our

engineering laboratories be advanced as rapidly as possible. I well realize the impossibility of obtaining sufficient funds at one time for anything like a complete equipment, and we shall have to content ourselves with the installation of such apparatus as will most enhance the needs of the Department and seems to be in the greatest demand.

With the exception of our equipment for field work in surveying—including stream measurements—and the work in mechanical test of engineering materials, we are still very weak in laboratory facilities. The following general laboratories are provided by the leading schools in Engineering: testing of materials, electrical testing, steam testing, hydraulic testing, and mechanical power and efficiency testing. As above suggested, we have a good beginning for laboratory work in material testing.

There are still, however, some urgent requirements for the Mechanical Laboratory, as follows:

1 Rhiele torsion testing machine	\$1,100.00
1 Rhiele Yale Extensometer	125.00
1 Analytical balance	85.00
2 Steam calorimeters, with connections	100.00
2 Fuel Calorimeters, with connections	100.00
1 Compression pump, with connections	150.00
1 Hempel gas analysis apparatus	200.00
Counter-shafts, hangers, belts, and incidental materials required for installation	140.00
	<hr/>
	\$2,000.00

With the installation of the substation and power motors, we now have considerable apparatus that could be used in connection with an electrical testing laboratory, but no part of this is available without suitable portable meters and adjustable resistances, and only to a very limited extent with these, unless currents of different quality (alternating or direct), potential, and frequency may be had. No engineering course is now complete without a knowledge of the fundamentals of electrical power generation, transmission and utilization. An equipment should be provided at once, including the necessary meters for measurement of current, differences of potential,

and power; together with the corresponding laboratory instruments. There would have to be a number of specially designed machines, the equipment aggregating not less than \$10,000.

Hydraulic Laboratory. In hydraulics, we are almost without facilities for laboratory work. When we consider the unique hydraulic systems surrounding us on all sides for power or irrigation purposes; and appreciate the cry of the engineering profession for scientific data, which will assist in making more accurate determinations of design; it will at once appear that this school, being the proper source from which such information should come, can no longer neglect the task of securing this material. We seem to have at our command remarkable facilities for the construction, at a reasonable price, of a highly satisfactory Hydraulic Laboratory and Power Plant. The growth of the College has brought us to the point where it is justifiable to bring such plans forward and strive to put them into practice.

The first requisites of such an arrangement—fall and water supply—are certainly at our command. Locating a laboratory building at the foot of the south terrace, between the southern boundary of present College property and the canyon road, an ideal site would be obtained. The irrigation canal owned and maintained by the Logan-Smithfield Canal Co. is available for water-supply at a point approximately 7,000 feet from this lower spot, with a fall of 250 feet in that distance. A simple calcu-

Power Plant. lation will show that one second foot of water falling from the canal to the laboratory site represents the gross power equivalent to a little more than 30 horse power. The hydrostatic pressure represents very nearly 100 pounds per square inch. With a suitable pipe laid from the canal to the laboratory, the corresponding power and pressure, with the usual losses, could be maintained; the first depending of course, upon the amount of water available. During the winter months when the College uses power, the water, which during the summer is used for irrigation purposes, runs to waste. Yet the canal from which such a pipe would be supplied must be maintained also during the winter, in order to supply the city system, and is then turned over to the city government. This canal has ample capacity for supplying the city and

what water might also be required for the College, and yet have water to spare. Investigation has shown that it is entirely practicable to purchase the necessary land for building and to secure a permanent water right for our purposes during the winter months.

During the latter part of May and the first of June, when the water might be required for irrigation, various arrangements would be possible: First, a division of the water might be made so that the power station might run under a light load and supply the lights required during the night, the balance of the water to be used for irrigation; Second, an adequate storage battery could easily be installed at a comparatively small expense and the power station closed entirely during the night, all the water being used for irrigation purposes. During the daytime or during College hours, it would be necessary, of course, to maintain power; but even in the event that all the water would have to be used for irrigation purposes during that part of the school year, the expense of generating power then by steam or even gasoline would not be unreasonable, and all water could be used during both day and night for irrigation purposes.

A building should be erected, amply large for both a power station and a hydraulic laboratory, including large measuring tanks which could be used for the double purposes of measuring flow from orifices, pipes and weirs, and for the rating of meters. The disposition of the water would not be a difficult problem, since the mill canal

is only 1,000 feet distant in a straight line on a gradual slope running south along the street. No expense would be involved for right of way. This canal is also maintained during all parts of the year and satisfactory arrangements can be made for dumping or tail-racing the water into this canal. With a system as above suggested we would be able to maintain a hydraulic laboratory which is, so far as I know, surpassed nowhere in this country, and we should avoid entirely the expense of pumping to lift the water in order to maintain a head, as must be done in the flatter countries where schools are not so suitably located for this purpose.

Several strong arguments immediately present themselves in favor of this plan.

1. The Educational Advantages. The entire plant

would become an ideal laboratory, which, used in connection with the mechanical equipment and the substation, would open almost the entire field of engineering practice.

2. The Financial Saving. Besides a saving of \$400 to \$600 a year in water tax, the generation of our own power at a minimum cost of maintenance would mean from \$2,000 to \$2,500 saved each year in the matter of light and power.

3. Fire Protection. The much-discussed problem of getting water to the upper floors of the building would at last be solved, and an ample protection from fire would be assured us.

4. Comparatively Small Cost. Owing to the natural advantages of our position, the expense of these improvements will be small indeed, as compared with what they would be elsewhere. The necessary outlay for the plant is estimated as follows:

7,000 feet 18 in. stave pipe at \$1.65	\$11,550.00
1,000 feet (approx.) Tail Race (boxed)	350.00
600 feet (approx.) Down-comer	1,500.00
Gates, elbows, manholes, etc.	1,600.00
	\$15,000.00
Erection of Building 100x40x14	\$ 5,000.00
Hydraulic equipment, including equalizer, pressure tanks, orifices, wiers, nozzles, etc	2,500.00
Current and pressure meters and gages includ- ing Venturi meter	800.00
Equipment for power development for College purposes	10,000.00
	\$33,300.00

In the Forge Room, Foundry and Carriage Shops, arrangements must be made for steam heating. The stove formerly used in the Forge Room was unsatisfactory there, and now the additional room makes a more modern plan absolutely necessary. This will cost \$900.

EQUIPMENT.

The equipment for Mechanic Arts must be larger, on

account of the increased number of students who are applying and are already registered for machine work. At present we have only four regular lathes and one milling machine. These machines are the general machines in any shop, and the number is entirely inadequate to the demands of students. We shall require the equipment suggested in the following estimate:

	3 Engine lathes, with chucks and	
For Machine Shops.	taper attachments	\$1,200.00
	1 Universal Milling Machine	600.00
	1 Tool grinding machine	350.00
6	New vises	60.00
	Shafts, pulleys, hangers, belts, etc.	150.00
	Tool cutters	100.00

		\$2,460.00
	1 15 horse-power motor	400.00
For Carpenter Shops	1 24 inch planer	600.00
	1 Swing cut-off saw	50.00
	24 Tole's Vises for new benches....	180.00
	Material for new benches	300.00
1	Doz. sets additional carpenter's tools.....	240.00
1	Universal wood trimmer	150.00
2	Slide rest lathes	300.00
	Shafts, hangers, belts, pulleys, etc.	100.00

		\$2,320.00
For Forge Shops.	Tool supplies, files, tool handles	200.00
	Material for new benches	150.00
	Additional vises	120.00

		\$ 470.00

SUPPLIES.

In addition to a sum of \$1,000 required for general supplies in the Engineering laboratories, the following list of supplies is needed in Mechanic Arts:

	Supply of Stock	\$2,700.00
Forge Shops.	Supply of Coal and Coke	1,500.00

		\$4,200.00

Machine Shops.	Supply of Stock	\$ 400.00
	Oil and Waste (for all shops)	600.00
Carpenter Shops.	Soft Lumber	\$2,000.00
	Hard Wood and Poplar	500.00
	Miscellaneous (files, glue, nails, brads, cabinet hdw., etc.)	500.00
		<hr/>
		\$3,000.00

SUMMARY.

Water system, power plant, and hydraulic laboratory:

Pipe Line, Building and Equipment	\$32,500.00
Equipment for mechanical testing laboratory	2,000.00
Meters and gauges	800.00
Mechanical appliances and general laboratory equipment	10,000.00
Supplies	1,000.00
Books and Magazines	500.00
	<hr/>
	\$46,800.00

Equipment for Mecchanic Arts	\$ 5,250.00
Supplies for Mechanic Arts	7,800.00
Heating System for Forge Shops	900.00
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	\$13,950.00

Respectfully submitted,
JOSEPH JENSON,
 Professor of Mechanical Engineering.

CIVIL ENGINEERING.

To the President of the College,

Historical. Sir:—The courses offered in the Department of Civil Engineering have remained practically unchanged during the past two years. It is the aim of the Department to be especially useful in preparing men for hydraulic and irrigation engineering, rather than along lines of structural engineering, as it is believed greater opportunities are offered in the former. The object aimed at in this course is not only to give the student a thorough training in the principles underlying these branches of engineering, but also to show the application of these principles to practical problems.

The work in surveying this year has been very satisfactory. The students are better prepared for the work than were those of last year, and the weather has permitted us to do a great deal of field work. The Department has also been supplied with a number of instruments which have materially helped us in our work.

Last year the Department was given a larger office, that the instruments might be kept there, in a case provided for them. The work of the Department has been materially improved by the addition of the equipment listed in the above report.

Plans for the work. In considering plans for the future, I should urge that a field course be given, in which the students would be taken to places where greater difficulties can be encountered than can be found near the College. In such a course, practical problems of considerable magnitude should be taken up, as regular surveys leading to construction work. Thus the student would become acquainted with the method of carrying out a comprehensive survey. In my opinion, a period of four weeks' field work should be required after the completion of the Sophomore year, either at the close of school or before school opens in the fall. By such a course we would increase the actual field work by at least three or four times the amount given now, and the quality would be much higher. This course

should be supplemented by one in office work in the Junior year, comprising the mapping of the notes taken in the field, such computations as might be necessary from the field work, and reports that are usually required on the work done.

A similar course, probably not so long, should be given between the Junior and Senior years, after the students have had their training in Hydraulics and are prepared to make measurements of the flow of water in canals and rivers. This course should also take up the proper division of water into the lateral systems, and the determination of losses in the various sections of canals, etc. Part of the time given to the hydraulic laboratory course during the Senior year, could be given to the working up of the data gathered in the field, and the writing of the reports as may be required from the work done. The equipment necessary to establish field courses for two classes would cost about \$250.00. Nearly all institutions similar to our own have at least six to ten weeks in the field during the summer vacations. These field courses are always considered important additions.

Require-
ments. The need of a hydraulic laboratory is no doubt the most urgent one in the Department. It is impossible for us to keep pace with other institutions of the same character as our own, that are provided with hydraulic laboratories, fully equipped with apparatus for carrying on extensive experiments, and making investigations on the flow of water. I therefore urge that some means be provided to make a beginning of such a laboratory as we ought to have. The plan outlined in the report of the School seems the most feasible.

During the next two years additional instruments will be required, including sextant, current meters, etc., at a cost of \$400. At least \$300 should be expended every two years for books on engineering. At present there is very little in the Library on engineering, outside of government reports. About \$150 will be needed during the next two years for repairs and incidental expenses. The teaching force is sufficient to give the work of the Department with the present number of students.

Respectfully submitted,

J. W. JENSEN,
Assistant Professor of Civil Engineering.

DEPARTMENT OF CHEMISTRY.

To the President of the College,

Sir:—We submit herewith the biennial report of the Department of Chemistry, including a resume of the conditions and work during the last two years, followed by a statement of the needs for the coming biennial period.

The Past Biennial Period.

Growth. The Department of Chemistry has experienced a steady growth during the last two years, in attendance and in the range of the work called for. To keep pace with this growth, the available rooms, the equipment, the time at the disposal of the instructors, and the amount of laboratory assistance, have also been increased.

Courses of Study. The following changes have been made in the courses offered. The provisional course in Metallurgy has been dropped and the following new courses have been added:—Chemistry 7, Advanced Qualitative Analysis; Chemistry 8, Advanced Theoretical Chemistry; Chemistry 9, History of Chemistry; Chemistry 10, Industrial Chemistry. Last winter a course in Irrigation was given by this department to students in the Winter Course, instead of the usual short course in Chemistry. All courses now offered by the Department, except Chemistry 14, Research Work, were taken by students during part or all of the past two years. As far as possible the work of the students has been so arranged that some of the advanced courses need be given only in alternate years. The instruction force is thus economized. In the work of instruction, persistent efforts have been made to develop studious habits and the power of concentration. It is gratifying to note that the students specializing in the Department have maintained, in almost all cases, a very high record in all their work. Of those graduating from the College during the last two years, 23 per cent had their major work in Chemistry, and without exception, they have made enviable

records in educational and professional work since graduation.

Rooms and Tables. Room 74 and part of room 73 have been suitably fitted out and are now used as laboratories for advanced courses and photographic work. In the former, enough new modern tables were placed to accommodate eighteen students. The Photographic Laboratory is arranged according to most modern plans, and will accommodate eight students at work at one time. Additional table room for eight students has been provided in room 64, the Elementary Laboratory.

Equipment. Some new apparatus for advanced courses has been added to our equipment, but because of the unexpected increase in the size of classes much of the funds originally intended for such apparatus had to be diverted to equipment, such as tables and the more common apparatus. Among the more valuable articles secured for advanced courses are an analytical balance, platinum crucibles, dessicators, graduated measuring apparatus, thermometers, toxicological chemicals, a camera, and photographic trays.

Supplies. Much in the line of supplies has been purchased during the last two years; yet because of the unexpected increase in the size of classes, we shall be left at the end of this year with even a lower stock of the ordinary chemicals than we had on hand two years ago. The amount of chemicals and apparatus per student will certainly be less. During this period, practically nothing, besides a few current periodicals, has been added to the general library for this department.

Requirements.

Course of Study. All courses now offered should remain available to the students and new courses should be added as demands for them arise.

Since electro-chemistry is becoming very important in modern industries, it is desirable that provisions be made to teach the elementary principles of this subject to students in Chemistry, and to such Engineering students as are interested in the applications of electricity. For this course considerable new equipment

would be necessary, much of which is also needed in the courses in general and analytical Chemistry now offered. Without much additional equipment, a good course could be arranged in iron and steel analysis, calorimetry, and other lines of chemical work especially suited to the needs of Engineering students.

It is doubtful whether Chemistry 2, 3 and 4 can much longer be arranged to come only on alternate years. These courses are required in the Agricultural and the Domestic Science courses in the College, and as those departments grow, it will be necessary to give the courses each year. Chemistry 1, the elementary class, if the present attendance continues, must be taught in two or three sections. This is necessary because of the capacities of laboratories and in the interest of good pedagogy. It seems probable that before the next biennial period ceases, three sections will be indispensable.

Instruction Force. With the outlook for students in the several courses, as indicated above, the instruction force and laboratory help should be correspondingly increased. It will require the equivalent of the full time of at least one experienced teacher for the class work and general supervision of laboratory work. An assistant will, therefore, be needed, who can take entire charge of the laboratory work in Chemistry 1, and who can help in advanced laboratory work. This assistant could also render much valuable service by reading exercises and examination papers; and he might possibly take charge of one or more courses, such as Qualitative Analysis, or Photography. We would recommend that an assistant who must at least be a graduate of a school of the grade of this institution, with chemistry as his major subject, be employed on two-thirds time during next year, and on full time during the succeeding year.

Rooms and Tables. The present room for advanced students will probably suffice for two more years. For purposes of the General Chemistry students, we now have table room and lockers for forty-four, with an enrollment of sixty-one. Assuming that the average increase of the last five years will be maintained for the next two years, we must provide for eighty-four students. To provide space for each student as at

present, we would need ten more tables of the size of those now in use, which cost about \$80 each. Not more than four more of such tables can be placed in the present laboratory. To use two rooms for the laboratory work of this class would be somewhat disadvantageous, especially if it would necessitate dividing any section between the two rooms, or having either room far removed from the store room and the recitation room. The only single room in the present buildings which is sufficiently large, is the Woman's Gymnasium. There are serious objections to the use of this room for laboratory purposes. It is inconveniently located with reference to the other laboratories and especially the store room and recitation room. The lighting is very poor, and expensive sky-lights would have to be provided. The water pressure of the present system, which is inadequate even on the second floor for some operations, is insufficient to assure a good flow on the third floor. The plumbing, and the installing of a special water system would involve an expense that would amount to thousands of dollars, and even then, because of inconvenient location, it would be at best a makeshift, for a few years. A far more economical and equally satisfactory temporary plan would be to place a few more tables in the room now used, to divide the cupboard spaces of all the tables into two compartments for each table, and arrange separate lockers for the two compartments, with two drawers above. Then two students from two different sections could be assigned the same work space as one now occupies, with a smaller locker space each. To make these changes in the eleven old tables would involve an expense of about \$200.

Considering the fact that any such arrangement as above suggested would not be very satisfactory for even two years, and possibly not satisfactory at all for a longer time, and that an expensive ventilation system will have to be installed as described below; that the plumbing needs overhauling; and that because of fumes and danger from fire and water, an expensive chemical laboratory should never be in a main school building, we believe it highly desirable to provide permanent quarters for the Chemical Department of both College and Station in some new building. This building could then be made practically fire-proof, with good plumbing, suitable pro-

visions against damage by floods, good ventilation, and convenient arrangement of rooms.

Although we have increased our stock of such apparatus as is included in the regular equipment of each student, we have been forced, during this year, to require students to work together for want of apparatus to equip all. We shall need the duplicates of such apparatus, amounting to two-thirds as much again as we now have. The stock from which to replace breakage, and the quantity of the chemicals must also be increased with the increase in attendance. Besides this larger stock of the ordinary chemicals and apparatus, we shall need for the elementary work considerable special apparatus for occasional use in the lecture room or the laboratory.

Aside from these amounts for new equipment for the different courses, there will be needed \$300 for the ordinary chemicals, for actual consumption in all courses during the two years; and \$105 for photographic supplies and additional photographic equipment for this department. To give the classes a clearer idea of many of the chemical industries that have sprung up, and, especially in recent years, are entering into the economical and commercial considerations in this country, we feel a need of illustrative material, both in the line of samples, and of pictures or charts. This, we think, can gradually be collected by members of the Department and friends, and the pictures needed can most economically be provided and kept in the form of lantern slides. To make such a collection of slides really efficient, a new stereopticon could be purchased, as the present one is so often in use for institute work and the like. For the purchase of the stereopticon with suitable lamps and other accessories, and for the illustrative material mentioned above, about \$150 is needed.

In the successful management of a large laboratory, some carpenter and metal working tools are almost indispensable. We suggest, therefore, that a small work bench, moderately well equipped with tools, be provided. This would cost about \$60.

Summary of Requirements.

	Additional tables for forty students	\$ 800.00
Equipment.	Other furnishings, including hoods, lockers, tables, shelves, ventilators steam generator, gas blower, plumbing, recitation room seats, telephone, office desk, waste jars, etc.....	1,325.00
	Chemical apparatus for advanced courses including museum specimens of organic chemicals	1,000.00
	Chemical apparatus for elementary courses...	660.00
	Stereopticon, slides, charts, etc., for teaching helps	150.00
	Work-shop furnishings and equipment	60.00
	Total	\$3,995.00
	Chemicals for use for two years	\$ 500.00
Supplies.	Photographic supplies and apparatus for chemical department	150.00
	Chemical apparatus and miscellaneous in small items not included in the detailed lists from which the above estimates were made	500.00
	General repairs for two years	150.00
	Total	\$1,255.00

To replenish the general library with modern books on Chemistry, especially on industrial chemistry, and with back numbers and current numbers of periodicals, a fund of about \$300 is needed.

Respectfully submitted,

J. A. WIDTSOE,

Professor of Chemistry.

P. A. YODER,

Associate Professor of Chemistry.

DEPARTMENT OF ZOOLOGY AND ENTOMOLOGY.

To the President of the College,

Scope of the Work. Sir:—The work of the Department of Zoology and Entomology has been somewhat modified in order to bring it more nearly in harmony with that of other similar institutions. The instruction in Zoology 1 is of a much more thorough nature than that commonly given in high school work. This is possible because of the superior equipment and facilities of the Department, and the greater time allowed. As this course represents the entire biological training of all short course students, and of the College students of the Engineering and Commercial schools, it seems necessary to make it as broad and comprehensive as possible. The other courses of the Department are planned to be equivalent, per credit hour, to similar courses in other agricultural colleges. In small classes, work will vary somewhat, according to the standing of the individual students electing it.

During the past two years the Department has been granted two additional rooms; room 32 to be used as a museum, and the adjoining room as a store room and preparation room, in exchange for room 36, which was transferred to Professor Clark. By a special arrangement made later, the Department has had the use of this room for the classes of Zoology.

Work to be Given. The work in Zoology can probably be given next year with the sections as now arranged—four sections in laboratory and three in class. If the proportional increase in students continues, five sections in laboratory work will have to be aranged for the following year. The work in Zoology 2 and 3, Entomology 1 and Bacteriology will be required next year, giving fifteen credit hours. Besides this there will probably be two other courses taken each term, with six credit hours, giving twenty-one credit hours first term and twenty-two hours second term.

Requirements. Owing to the unexpectedly large increase in attendance, the amount of assistance furnished during the last two school years has been scarcely sufficient to allow of adequate handling of the laboratory classes alone, without consid-

ering the other interests of the Department, such as Station work and Museum building.

To carry on the work as outlined for next year, in connection with the Station duties, it will require the full time of a competent assistant; and if the work increases some provision should be made for a small amount of student labor, for the more mechanical parts of the work.

On looking over the general situation, it seems to me that there is nothing that would do more to strengthen the institution as a whole than the bringing together of the scattered divisions of the Agricultural Department in an Agricultural Building.

This would tend to strengthen the work of the Department in many ways. It would bring instructors and students into closer relationship with each other; it would make a wider range of apparatus, books, microscopes, tools, etc., available to each department. The Museums could be built up and used together. It would do away with the present cumbersome Experiment Station arrangement, in which the offices, the stenographer, the bulletin files, index cards, photographic apparatus, mail, etc., is in a building away from the College work of the same departments; this arrangement entirely excluding the possibility of doing office work and at the same time supervising, or being in touch with assistants or students, or being readily accessible to other members of the staff.

Should such a building be erected, this department should be transferred to it, and in that case, it would not be worth while to make any changes in the present quarters. If, on the other hand, the Department is to remain where it is, a partition should be made through room 32, cutting off a small office and laboratory room from the larger general laboratory. It would then be possible to work small and advanced classes in this part, and the larger ones in the general laboratory. In much of the work of Histology, Embryology, and advanced Entomology, much table space is required that cannot be cleared off to make way for lower classes without seriously interfering with the work. Such a partition with one door and transom, and three half windows would cost about \$50.

There should also be a sink placed in the north-west

corner of the large laboratory. All dissecting work must be done near the light, and it is very unhandy to be obliged to travel to the further corner of a long room for all washing. Such a sink with connections would cost about \$30.

Room 36 is being used for the classes in Zoology 1 at the present time; and it would be a decided advantage to the Department if all recitation work could be carried on there, so as not to interfere with laboratory and preparation work.

Office and Laboratory. In order to make the work of the Department as efficient as possible, several card indexes should be started and kept apace with the growth of the Department. An index to the available literature on subjects taken up in biology, histology, embryology and advanced entomology, and an index to slide mounts and what they contain, should be started now. Without the museum index and the slide index much that is discovered will be forgotten or unavailable. This work will be started this year in a small way, and by providing a small outlay of cards and cases it can be kept up.

There should be one more medium-length table and two smaller work tables provided for the laboratory and work room. These could be moved from one place to another as the light and the work required. Such tables will cost about \$20. This department has been using eight microscopes belonging to the botanical department each year, and even then the work in Zoology 1 is hampered by the lack of instruments. The work in Botany will now require the use of most of these microscopes, and as there are four sections in Zoology and two laboratory periods in Botany, it will be impossible to prevent conflicts. So this department must look to its own equipment soon. It seems best, therefore, to recommend the purchase of eight new microscopes, as the smallest number with which the Department can arrange to accommodate its work.

For the work in general Zoology, a partial set of Leukart and Nitsche's Charts should be purchased, showing typical dissections in color. For the work in comparative anatomy in Zoology 1, and also to assist in Zoology 3, a foetal skeleton, a gorilla skull, and a bust of a male

gorilla are needed. For the work in Entomology, a larvae-inflating apparatus and a small series of exotic forms should be purchased.

Museum. There is material enough on hand to more than fill the present museum cases. Part of

this will be put on exhibition as soon as time permits, while part of it cannot be prepared until suitable glassware is provided. In order to provide for the additions of the next two years, and for material now on hand, \$150 in cases will be needed. Two exhibition stands should be provided for the insect cases. These can be had for about \$65.

The insects on hand are nearly sufficient to fill all cases provided; and as the collections grow by capture and exchange it will be necessary to provide more room. For this purpose \$40 in new cases should be granted.

The Smithsonian collection of Invertebrates and nearly all alcoholic material collected is standing in bulk for want of suitable glassware. Very little can be done in collecting larger alcoholic material, such as fishes, etc., until suitable storage and exhibition glassware is provided. This can be obtained much more cheaply by importing in quantities. An amount sufficient to exhibit material on hand and probable accessions could be purchased for about \$80.

An Aquarium fitted with water connection and place in the laboratory, would furnish a storage place for living material for laboratory work; and if kept supplied with a variety of living things, would be of much educational value in an ecological way. Such an Aquarium could be fitted up for \$30.

There should always be a small amount of money in the form of a general appropriation, for the purchase of material, taxidermy work, etc., as occasion offers. Often a small collection or rare specimen can be secured at a nominal cost if funds are available. Such a fund can be used as required, and anything left over at the end of the period invested in museum specimens from the regular dealer. For this purpose a fund of \$150 should be supplied.

Summary of Requests.

Office Equipment.	Desk	\$ 60.00
	Cards and Case	20.00
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	Total	\$ 80.00
		\$ 80.00

Laboratory and Class Equipment.	Three tables	\$ 20.00
	Ten wall charts	25.00
	Eight microscopes	400.00
	One Foetal skeleton	10.00
	One gorilla skull	20.00
	One gorilla bust	10.00
	<hr/>	<hr/>
	Total	\$485.00
		\$ 485.00

Museum Equipment.	Cases	\$150.00
	Insect cases	40.00
	Insect stands	65.00
	Glassware	80.00
	Aquarium	30.00
	Specimens	150.00
	<hr/>	<hr/>
	Total	\$515.00
		\$ 515.00

Grand Total Equipment. \$1,080.00 \$1,080.00

Supplies.	For work in Zool-	
	ogy	\$125.00
	For work in Ento-	
	mology and Bac-	
	teriology	75.00
	For museum	100.00
	<hr/>	<hr/>
	Total	\$300.00
	Partition and sink	80.00

Fees for the next two years at the present rate of assessment will amount to about \$450, which will offset the supplies and leave a small amount to pay for the wear and tear on laboratory equipment.

Respectfully submitted,

E. D. BALL,

Professor of Zoology and Entomology.

DEPARTMENT OF GEOLOGY AND MINERALOGY.

To the President of the College,

Sir:—In the year 1903-1904, four courses in Geology were given. Besides what is known as Geology 2 in the catalogue, courses were also given in Physiography and Mineralogy, and a special course was given to a class in Assaying. A course in Mineralogy was also held during the summer of 1903, and a course in Geology during the summer of 1904.

The standard of the work done in Geology is anything but low, as the students who take this work are nearly always Seniors, and very able to do high grade work. The work done in Mineralogy is variable. It is taken only as a special course, and the grade of the work depends much upon the prerequisites of the student.

During the year 1903-1904, the Department was moved from crowded quarters in one room on the third floor, to four rooms in the south basement. At that time we were sadly in need of equipment; but since then about \$300 have been carefully expended in procuring a very limited working set of equipment, consisting principally of open shelf cases for specimens, museum tables, fluxing table, work table for Mineralogy, analytical desk, analytical balance, new materials, and the building and arranging of a double muffle furnace for work in Assaying.

The time of instruction has materially increased. During the year 1902-1903, only five hours of my time were given to the Department. During the year 1903-1904, seven hours of my time were given to teaching in the Department, and this year twelve hours are required to give the necessary instruction.

Plans for the Future. For the next two years it is not the plan to change materially the courses now offered, but to strengthen each course and make it conform to the demands of standard work in Geology. In addition to the class room work, it will be the aim to introduce more and more field work each year, until the training entirely meets the demands of the practical engineer and miner, and is brought up near the standard of the Government Survey.

Courses will be offered in General Geology (Geology 2), in Structural Geology, especially for engineers (Geology 3), in Economic Geology, Mineralogy, and Assaying. The sections will not be large, and I think the work will require about twelve hours per week of instruction. For the next two years, we shall probably be able to get along with the rooms we have. However, we are badly in need of a small room for storage and sampling of unclassified material.

Requirements. To do efficient work in Geology and Mineralogy, we should have the following equipment:

One set of maps in roller cases	\$ 50.00
One set of Paleontological Charts	55.00
One set plaster cast models	150.00
Plaster relief maps of special sections	200.00
Three floor museum cases	120.00
Plaster cast and Fossils	100.00
One gasoline furnace	25.00
One pair Pulp balances	35.00
One Compound Microscope for work in Petrography	95.00
Expense for traveling in collecting materials ..	100.00
Miscellaneous Equipment	199.00
Supplies	275.00
 Total	 \$1,404.00

Respectfully submitted,

WILLIAM PETERSON,

Assistant Professor of Geology and Mineralogy.

DEPARTMENT OF PHYSICS.

To the President of the College,

Sir:—There have been no changes in the courses offered in Physics during the past two years, the work requiring six hours of instruction each year.

The Department has been moved from the rooms on the first floor at the north end of the building, to better apartments on the second floor in the south end of the building, and now occupies four rooms nicely located,—a class room, an office, a store room, and a laboratory.

The courses offered in the next two years will be the same as are now offered, a course in general Physics and a special course for Engineers.

The course in general Physics will require at least two sections, the section at present being much too large. The course in Physics 2 can probably be given in one section. So under the present arrangement, with the class reciting but twice a week, Physics will require at least nine hours of instruction per week for the coming two years. However, I should strongly recommend that more time be given to the course in general Physics. The equipment necessary for the next two years' work is estimated as follows:

Laboratory tables with fixtures	\$ 300.00
Desks to be fastened to wall	150.00
Window shutters to exclude light	75.00
Rotary air pump	100.00
Reaction gas wheel	250.00
One compound microscope	150.00
Miscellaneous equipment for elementary Lab..	660.00
Miscellaneous equipment for advanced Lab....	815.00
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Total	\$2,500.00

Respectfully submitted,
GEORGE P. CAMPBELL,
Assistant Professor of Physics.

DEPARTMENT OF MATHEMATICS AND ASTRONOMY.

To the President of the College,

Sir:--There have been no changes in the courses offered by the Department of Mathematics and Astronomy during the years 1903-05. The work of the preparatory courses is improving in grade, and the students entering those courses come to us with better preparation than in the past. The effect of this improvement in the class of students received into the lower courses will be felt in the regular College work of the Department. More students are entering the advanced courses than ever before, who have received their elementary work in other schools and colleges. The course in Mathematics 6 is being given this year for the first time. It will be required of all Engineering students who graduate after 1905. This year it is given as an elective. There is a marked increase in the attendance of the Department over other years.

There are four instructors in the Department, including the head of the Department. Of these, three are giving full time to the work, while the fourth gives us only five hours. In this respect there is a marked improvement over former years. We were given three adjoining rooms in 1903, and an office for the head of the Department. This arrangement is a very great improvement over that of former years, but still we do not have the room required for our work.

The courses given by the Department will change but little during 1905. Mathematics 6 will be given as a required course and there will probably be one elective given. The number of sections, however, will increase, both in the elementary and college courses. The number in the preparatory work should not increase, and the present sections should be sufficient for the accommodation of students in Mathematics 1. There are at present five sections in Mathematics 2. With the present rate of increase in attendance, at least six sections will be required next year. One additional section will be required in Mathematics 3, and one additional section in Mathematics 4. This would mean seventy-eight hours of class work

per week. We will need the entire time of two instructors in addition to the five hours given by Mr. Peterson and the eighteen hours by the head of the Department. This leaves ten hours unprovided for, if the increase in the number of sections should come next year. We recommend that one instructor be employed, who, because of his age and scholarship, will lend dignity to the Department.

Additional rooms should be provided for the Department, on the floor where it is at present located. One additional class room is necessary under present conditions. The room now occupied by the head of the Department should be furnished with three study tables. These tables should be provided with drawers for use of individual students in the advanced courses. In one end of the room a case for the models should be built. The room could then be used by the advanced students of the Department for a study room, where the instructor could meet the students outside of class hours, and give them such help as he sees fit in the preparation of lessons. New settees will be required in rooms 89 and 91. The models of which we made mention in a former report are now a necessity, and may be procured for \$600.

We have at present a list of books which should be purchased for our Library, amounting to \$300. \$500 will not more than meet our needs for books during the two years.

Respectfully submitted,
W. S. LANGTON,
Professor of Mathematics and Astronomy.

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE.

To the President of the College,

Sir:—During the biennium now drawing to a close, the Department of English has faithfully and successfully carried out the plans proposed in the last report. The methods of instruction outlined there and in the catalogues have been followed almost to the letter, by a

department faculty working with perfect harmony and commendable zeal. Courses are gradually becoming less rigid, and more vital and practical; so that students generally are more attracted by the work, and show increasing appreciation and power of expression.

There has been a marked increase in enrollment in most classes, although the numbers in English 1 and 2, elementary courses, have if anything decreased, except during the weeks of the Winter courses. In all classes the standard of capability is perceptibly advancing. There is one difficulty worthy of special mention at this point. Many of the students coming to us from eighth grades have not had the thorough drill in grammar which the public school system expects and which we must take for granted in English 3. The Department has been criticised on the ground that we do not meet the public schools at this point. Our opinion on the matter is that we do our highest duty to ourselves and to the state, when we meet the work of the better class of public schools, those that carry out faithfully the ideals of the state school system.

The instruction force of the Department has experienced considerable change, but the general policy has continued uninterrupted and has found candid support from all concerned. Today the Department is a unit in ideas and ideals, although the several instructors maintain their individuality in the detail of methods. Machine-made instruction is avoided in all of the English work.

Allied Interests. In addition to this regular internal development, the Department has seen fit to branch out in certain legitimate lines, which seem highly profitable to the students and the institution. In November, 1902, the College magazine, "Student Life," was founded, and placed in charge of a staff chosen from the student body. Although the work has been done by students from the beginning, the Department has constantly maintained an advisory attitude toward the publication, and exercised a moderate degree of censorship. The rapid growth of the magazine, and the general recognition it has received throughout the College, would more than repay all efforts devoted to it.

Two years ago there was an apparent craving throughout the institution for amateur dramatics, and several abortive attempts were made in that direction. Finally the Sorosis Society, under the direction of the Department, undertook an elaborate presentation of Shakespeare's "Midsummer Night's Dream," and achieved a success that was little short of phenomenal. Last year, with a mixed cast, chosen from the student body, the Department prepared a production of "As You Like It," under the business management of "Student Life." This performance was on the same extensive scale as the previous one, and met with a similar success. At present, steps are being taken to present Goldsmith's "She Stoops to Conquer," and the prospects are extremely favorable.

The institution remains lamentably weak in the matter of literary and debating societies. While the English Department feels no immediate responsibility in this matter, as a committee of the faculty has charge of such organizations, all Department resources are at the command of any such society that will organize with a serious purpose in view. Much of the work of the old-fashioned literary societies is now absorbed in college magazines, but there is a demand everywhere for good debating practice. English 7 offers debating work to a limited number, and efforts are now being made to organize several general debating societies in the College.

Financial. The equipment of the English Department is naturally limited to the furniture of the class rooms and office, and to the books in the Library. Last year a small, but conveniently located room on the first floor was fitted up, to be used jointly by the English Department and the Staff of "Student Life." It has served its purpose admirably, although the furnishings have been inadequate. Last year the Department succeeded in getting a much-needed addition of books to the Library, but is always in need of accessions to this, its only laboratory. Probably \$200 will supply all the technical works on English Language and Literature needed at the present time. There is, however, one very urgent requirement. Students in History of Literature—over fifty in number—are required to become well acquainted with the important writings studied. The 100

students in English 5 are expected to read five approved works of fiction during the year. Naturally this creates an imperative demand for duplicate volumes. From three to six copies of all important works should be purchased at once, in order to make these classes successful. All standard books added to the Library are welcomed by the Department.

Prospective. During the next biennium there is no apparent need or disposition to make any changes in the English courses. The present system has been over two years in taking form, and seems to meet all existing requirements. The present series of electives will continue to be catalogued, two or three being selected from the list each year. In sections several changes are necessary.

In English 3 and English 4 there are already enough students for six sections each, and with the probable increase in the next two years, no less than seven sections can possibly suffice. In English 5, three sections will be the minimum, and these will, no doubt, be overcrowded by the end of the biennium. With these additions, allowing five hours a week for electives and six hours for the two elocution classes, 129 hours of instruction per week will be demanded of the English Department next year. This will mean the employment of one more full-time instructor in the Department.

Respectfully submitted,

A. H. UPHAM,
Professor of English Language and Literature.

DEPARTMENT OF MODERN LANGUAGES AND LATIN.

To the President of the College,

Historical Sir:—The work in foreign languages the past two years has been in charge of Professor A. E. Wilson, the first year, and of Assistant Professor Frank R. Arnold, the second. Each year, courses in German, French, Spanish and Latin have been given; the past year showing a slight decrease in the size of the German classes, with a corre-

sponding increase in the French and Spanish. A course in second year Spanish is given this year for the first time within the history of the institution. The work done has been of College grade, and has amounted to twenty-eight hours of class work weekly, including three courses in German, two in French, two in Latin and one in Spanish. The aim is to give students that thorough linguistic training which will enable them to read easily the scientific books and periodicals of foreign countries, and at the same time give them closer insight into the value and structure of their mother tongue.

**Require-
ments.** The chief equipment in Modern Language courses is an enthusiastic experienced teacher, with proper foreign training; but there are also other details of equipment, of minor importance, some of which are lacking in our College. No Modern Language teacher can do thorough work without constant reference to maps. On the walls of the Modern Language class room should be maps of France, Germany and Spain. As I have already stated, the main object of our work is to train our students to read foreign scientific literature. To do this they should have other books within their reach than textbooks. The College Library should receive at least one scientific periodical from Germany, one from France, and a newspaper from Spain and Mexico. Besides this, the Library should contain some of the representative scientific and literary works of foreign countries, especially the modern ones.

At present the College Library does not contain ten books printed in a foreign language, and it receives no foreign periodicals. The Department asks for an appropriation of \$150 to be spent in the purchase of maps and foreign books and periodicals.

The faculty is friendly to the Department, and in requiring two years of modern language work of all who wish to graduate with a degree, it puts its students on a plane with those in the eastern scientific schools. Where the Department has most suffered has been in the change of teachers each year. No instructor, however well equipped, can build up a department in a year. He can make his influence felt and can do good daily work, but to make his work of the widest influence in the Col-

lege and state and to develop fully his plans for the important place he feels his work should take, several years are often necessary.

Respectfully submitted,
FRANK R. ARNOLD,
Assistant Professor of Modern Languages.

DEPARTMENT OF HISTORY AND ECONOMICS.

To the President of the College,

Scope of the Work. Sir:—The Department of History and Economics now offers the following required courses: Greek and Roman History, United States History, Constitutional United States History, and Modern European History. American History, English History, and Sociology are optional with students. Two courses are offered in Political Economy. Course 1 is required of all freshmen in the School of Commerce; course 2 is required of seniors in all of the schools except the School of Commerce. There are no prescribed history courses in the College proper. In my judgment this omission is anomalous, and places the College in an unfortunate light before educators. The fact that all the required courses in history are placed in the first or second year of the preparatory work, renders it impossible for the Department logically to determine the sequence of courses. This difficulty may be overcome by adding another year to the High School work, or by placing certain required history courses in the College proper.

The Department of History and Economics is making a steady and healthful growth. It now employs two-thirds the time of one instructor, besides the entire time of the professor in charge. While the text book is still made the basis of our recitation work; yet at the same time research work within limits and the reading of general historical literature are both on occasion required, and at all times encouraged. A commendable interest and enthusiasm is manifested throughout the entire Department. It is not our intention slavishly to adhere to any certain school of methods. Conditions and

circumstances are always considered in presenting any of the courses.

Requirements. Apparatus and equipment are necessary in the efficient presentation of any subject. The work of this department is no exception to the preceding statement. We need all the money we can get for the historical library. The Library is our laboratory. Without it we can accomplish but very little; with it we may accomplish much. There should be in the College Library all the standard and recognized historical works. We also need a large number of reliable publications on current history. Much of the printed matter on current history is found in papers and magazines possessing general literary merit. It follows then that the purchase of such publications possesses double value.

The library work, so far as our students are concerned, is becoming more effective every year. They appreciate highly the courtesies extended to them by the library management. It is of the greatest importance to encourage this work. Aside from the historical information gained, the fact remains that many of our students come from communities where library opportunities are exceedingly meagre. Such a valuable opportunity coming at a favorable period in the lives of young people ought to be made much of.

History is a fundamental subject, and therefore a certain amount of it is necessary in any and all courses. It is true, however, that agricultural colleges, in the larger and truer sense, are industrial universities. In these institutions both federal and state governments unite in their efforts in promotion of scientific research and practical industrialism. In view of the preceding facts, it would be in keeping with the spirit of the age and in strict accordance with the letter of the law to emphasize in agricultural colleges such subjects as political economy, sociology and political science. From a practical standpoint these subjects are of equal value to all classes. Every year they are being more thoroughly appreciated by educators. In an agricultural college certain lines of research work in political economy and sociology ought to be carried on from year to year. No field of human activity presents richer materials for con-

structive work in economics and sociology than does agriculture. In so far as it may be practicable, I would recommend the encouragement of research work in political economy and sociology.

Respectfully submitted,

JOHN FRANKLIN ENGLE,
Professor of History and Economics.

DEPARTMENT OF DRAWING.

To the President of the College,

Sir:—There has been no change in the *Historical* general plan of work during the past two years from the scheme which was then worked out. The scheme was arranged to meet as nearly as possible the demands of an institution of this character. The work has been varied somewhat in character, in order that it might best adapt itself to the needs of the different courses for which it was designed. The work generally has been very successful, as the walls will bear witness. There has been a great deal of attention paid to the creative side, which was previously a little weak; and this phase of the subject has helped very much to increase the interest of the students, particularly when they realized its importance and relation to the work they were following. This kind of work is interesting to many because it represents self-expression. The aim has been to balance as nearly as possible the objective and subjective branches of the study; to stimulate and develop both the imitative and creative faculties.

The quality of the work in general has struck about the same plane each year, and has been pretty fair. On account of having almost entirely a new set of students each year, a large proportion of these not having had any instruction in the work before, the general average must remain about the same. A number of drawings, however, have been of excellent quality. The character of the drawings displayed in the Agricultural College Exhibit at the State Fair last year brought some very favorable comments.

Six sections a day the first year and seven sections the second year were required to accommodate the stu-

dents. Seven sections are necessary this year and a like number will, undoubtedly, be required in the future, possibly more.

The total amount of work has amounted to something over thirty hours a week the first year and thirty-five hours a week the second year. This year it will be the same as last year, and in the future perhaps more hours will be required. The sections are becoming so crowded in many instances that an assistant is greatly needed. If the increase is as great in the future as it has been during the past two years, which will undoubtedly be the case, there must be an assistant to help in the work. I should very much prefer to use an advanced student if possible.

Financial. The expense for equipment during the past two years has been very slight. The rooms were large enough to accommodate the number of students in attendance when I first took charge, so no addition was made then; but the steady increase in attendance since then, has made us more than cramped for room; and with the outlook for the future the dimensions will certainly be far too small and room will become very much crowded. The furnishings generally were very good, containing a generous quantity of models for drawing. There were some good plates on design; not very much, however, and rather a scanty collection of large pictorial reproductions. There has been rather a plentiful supply of small models so far, but as the number of students in each section increases and the amount of space is increased, there will have to be an addition made to the list of primary objects, the simple casts, objects, etc. A list will be made up later.

From time to time, forms have been brought up from the Museum, birds, mammals, etc., and added to the collections, but without any expense to the institution. These forms have helped to increase interest in the work. Drawing boards have been added now and then and will continue to be required in the future.

Requirements. I must make a request now for some reproductions of famous pictures to be used in the composition work, and also some plates on design, the sum of \$50 being necessary for this purpose. I hope also that a

substantial sum may be allowed for library books for the Department this year. The Woman's Club and the Sorosis Society have both used this division of the Library a great deal in their work, in addition to the help found there for regular department work. In the equipment of the class rooms, a great many more chairs will certainly be needed. Frequently this year there has been a deficiency in some sections, and we have been obliged at times to bring stools from the Commercial Rooms. For casts, models, pictures, designs, etc., from \$250 to \$300 ought to be allotted this department as a purchasing fund.

Some plans are being drawn for rooms to be used by the Department in the future. The scheme is to take the top or fourth floor, west of the stairway, and divide that space into six parts, three on the north side and three on the south, with a hall running through the center from east to west. The partitions will not be carried up to meet the roof, but will be left entirely open above, so that the circulation of the air may be very good and as much light may be diffused as possible. The ends of these divisions facing the hall will be left open, with the exception of the south-east corner, which will be enclosed by a partition the same height as the rest. This south-east division will serve as a private studio, and will be used by the instructor and by students who have some particular work to do and who wish to be more secluded. When these apartments have been properly finished and equipped, we shall have a group of Art Rooms large and commodious enough to satisfy our requirements for many years. An architect has gone over the ground and carefully estimated the cost of these improvements at \$3,000, the appropriation of which I urgently request.

Respectfully submitted,

H. J. STUTTERD,
Instructor in Drawing.

School of Music.

To the President of the College,

Scope of the work. Sir:—The School of Music is in charge of a Director and five instructors. New as it is, there are already 158 students enrolled. The students in the various courses are fairly talented and deeply interested, and are making good progress, considering the limited time they have for practice.

General instruction in Music is free to all students of the College;—to vocal students, in the Choral work; to those doing instrumental practice, in the Band, Orchestra, and Club work. All general work is under immediate supervision of the Director. The Choir of fifty voices is practicing and will render during the year an Opera and an Oratorio, in addition to the usual study of hymns, anthems and other works suitable for chapel exercises.

The Orchestra, consisting of fifteen players, is studying the accompaniments to the foregoing Choral works, and will take part in their rendition later. This is in addition to the regular dance music, in which the members are drilled and find practice work.

The Military Band is an organization of thirty-four instruments, and has already made a successful showing. In addition to a first-rate concert, given December 19, 1904, it has secured several engagements that have been filled in a businesslike way, giving complete satisfaction.

It will assuredly become a strong feature of the College, and will extend the name of the institution in the work of concerted or general instruction—so impossible to obtain outside of a very limited number of college and great professional bands of the country. The object of such an organization is three-fold:—to fit students properly for membership in the best bands; to raise the standard of band music in a general way, locally; to appear publicly in the interest of the College.

The Mandolin and Guitar Club is pursuing work

having in view the definite end of perfecting its members in notation and technique. Facility on these instruments can be acquired rapidly, and if placed upon a proper basis,—that is, correct knowledge of music and the instrument—should afford one of the happiest diversions within the reach of young people.

Private instruction is provided in Theory (Harmony and Composition), and on piano, organ, violin, violoncello, mandolin, guitar, cornet, clarinet, saxophone and other band instruments.

The courses, as arranged, parallel as nearly as practicable those offered by the leading Conservatories of Music; and are proving successful, as is evidenced by the ever increasing enrollment.

These opportunities for the acquirement of musical training, either for professional or other work, are further enlarged by the free Faculty Recitals, which occur at frequent intervals during the school year. The music rendered at such concerts is from the classics, and is selected with care for the purpose of developing an appreciation and love for the truly genuine in art.

The faculty organizations include:—a mixed vocal quartette; a string quartette; a pianoforte trio;—all capable musical organizations.

As soon as possible private instruction on all band and orchestra instruments should be obtainable by the students without charge.

This would of course necessitate the paying a salary to instructors on brass and string instruments. The Department should have the exclusive use of a band room and the four rooms opening into the Chapel Auditorium, also access to the gymnasium piano whenever it is not in use. We are now using two pianos in addition to those owned by the College. They are rented by the Director and Piano Instructor. An appropriation of \$50 a year is needed for care of the College pianos. During the next two years we should have \$600 to equip the band properly with instruments, etc. An appropriation of \$200 will cover the supplies necessary for this period.

Respectfully submitted,

G. W. THATCHER,

Professor of Music.

Military Department.

To the President of the College,

Historical. Sir:—On assuming my duties as Military instructor, in September, 1903, I found that the Department had been for five years in charge of a graduate of the College, no army officer having been on duty here since 1898. The interest in military work among the students, while not general, appears to have been very good among those who were registered in the Department.

It is gratifying to be able to report that the interest has greatly increased during the past year. The enrollment at present is 196, compared with 168 last year. The cadets have recently been organized into a battalion of three companies, with a band of thirty-four members and an artillery detachment. The work as prescribed by the War Department consists of the following:

Practical. Infantry Drill regulations, (part)
Advanced and rear guards, and outposts.
Marches.
Ceremonies—battalion review, inspection,
parades, guard-mounting, and escort of the
colors.

Theoretical. Infantry Drill regulations, (part).
Manual of guard duty.
Small arms firing regulations, (part).
Ten lectures on military subjects, students
taking notes and reciting subsequently.
Keeping of records.

These requirements have been carried out with the exception of ceremonies, which, under the recent ruling of the War Department, are to take place outside of daily drill period. On account of the great amount of laboratory, field, shop and forge work at the College, it has not

been found practicable, so far, by the faculty to grant an extra hour for this work. The annual encampment last May, however, was devoted to some of the ceremonies required, and some were held in the regular drill period.

Target Practice. About fifty hours of extra time, principally on days when the College was not in session, have been devoted to target practice.

Excellent results have been obtained in this practice, which has included skirmish firing, as well as at unknown distances,—100, 200, and 300 yards. 115 cadets have taken part in this target practice during the year, and the keen interest shown by all was heightened by the success of our rifle team, which won first-place in an inter-collegiate rifle contest, in which the following other institutions participated: University of California, University of Iowa, Washington Agricultural College, and Pennsylvania Military College. Our rifle team consisted of the ten most expert shots, firing ten shots each off-hand at 200 yards, under the same conditions that govern regular army firing, and scored 432 points out of a possible 500, being 14 points ahead of the University of California, which has for a number of years stood highest in these contests.

One more target with butt is needed; some repairs are necessary to the one now in use, and a shelter should be provided for target material. These items are included in the general estimate of amounts required during the next two years, but special attention is invited to them, so that proper equipment may be had for this important branch of the practical work in which such good progress has already been made.

New Armory. The facilities for out-door drill are ample, but the room in the basement used for in-door drill no longer fulfills the requirements of a drill hall for the number of cadets now under instruction. Only about 80 cadets can be accommodated at once for bayonet or other gymnastic exercise. A serious disadvantage, also, of this room is the fact that there are six large posts in it supporting the floor above. The cold weather and snow make it impracticable, as a rule, to have any out-door exercises for nearly four months during the winter and early spring. I therefore strong-

ly recommend that a suitable drill hall or armory be erected as soon as practicable.

The Annual Encampment. The first annual encampment of the battalion was held from May 12th to 18th of this year, and was an unqualified success. The expense to the College was insignificant, compared with the good results obtained. The time was devoted to practical exercises which could not, for want of time, be held during the daily drill period. These consisted of out-post duty, advance and rear guard, skirmish and volley firing, and duties of patrols. The battalion marched to and from camp, a distance of sixteen miles. The authorities of Fort Douglas assisted materially by loaning tents and camp equipage for the encampment. Two enlisted men of the regular army, one an experienced cook, and the other an expert hospital corps man, were also sent by the commanding officer and rendered valuable assistance. I consider a week's encampment of more value to the cadets than several months of training, limited to the hour a day. The amount required during the next two years for the expenses of encampments and miscellaneous equipment will be \$600.

More rifles and equipments are needed, and will, no doubt, be easily obtained from the government, as soon as it is practicable to carry out the instructions of the War Department. The number of those withdrawing becomes less each year, however. If more rifles can be obtained, the new model should be asked for. The muzzle loading cannon should also be exchanged for the breech loading kind if practicable.

While we are at a disadvantage here in the matter of progress in military training, compared with those institutions whose students all room on the grounds and are more or less under control at all times, the results obtained have been fairly satisfactory, and conditions are improving steadily.

Respectfully submitted,

HENRY D. STYER,

Captain 13th Infantry, Professor of Military Science and Tactics.

Department of Physical Education for Men.

To the President of the College,

Sir:—It is universally understood among physiologists that there is an intimate relation between the voluntary muscles and the vital organs. If the latter are kept in good working condition, the former must be exercised. Students who work out of doors all summer are apt to feel that they can do without exercising during the school months, and therefore devote all their time to their studies. The error here is obvious, if one stops to consider that the body is made up of cells, each one of which is essentially like a stove, in which a fire is constantly burning. Fuel is steadily being added in the form of food. This fuel is partially consumed in the work of study and in the movements necessary for mere existence. Some of the work products pass off, but without vigorous exercise the tissues become clogged with an excess of unburned fuel and with waste products. In other words the stove is choked up; the fire burns less brightly and the student wonders why it takes him two hours to do one hour's work. It is not enough to clear the fire each summer. Daily renovation is required.

Everybody should learn to know the pleasure of a good sweat, followed by a cold shower which braces the nerves. Such an experience three or four times a week makes one vigorous in his work, and an agreeable, profitable companion in play time.

Exercise taken for the sake of health is soon found to bring about increased muscular strength. The muscles become larger and firmer, and what is perhaps most valuable, the individual gets control over his strength. He finds that he can do things, before impossible, not for lack of strength, but for lack of power to direct his

Gymnas-
tics.

strength. Very many of our students are accustomed to hard work and have a high degree of muscular strength. They are, however, awkward in their bearing and not at all versatile in applying their physical powers.

In other students, their early occupation has developed a few sets of muscles while others have remained practically unused. The basis of this statement is the round shoulders; the cases of one shoulder lower than the other; the case of the hips thrust forward when an attempt is made to stand straight, etc. To attain for our young men a full, muscular development, with the adequate co-ordination of brain and muscle, is of vital importance, and comparable in value with the maintenance of general good health.

New Gymnasium. That systematic exercise for students is universally considered of utmost importance, is shown by the fact that a well equipped gymnasium is an essential with every institution that attempts a well balanced education. In fact, in many institutions, gymnastics are required as part of the work necessary for a degree. In other colleges and universities, the work, although voluntary, is considered of such value that it may count toward the requirements for graduation.

There immediately arise a number of obvious reasons why the Agricultural College, with its hundreds of diligent students, feels an imperative need for a new Gymnasium Building.

1. Military Drill, when not combined with gymnastics, comes far from meeting the demands of a student for physical training.

2. Military Drill is limited to two years in the case of most students, and is rarely taken by upper classmen.

3. The bathing facilities alone are worth to a school the cost of a good gymnasium.

4. The gymnasium is the best place to discover and develop athletes for college teams.

5. The present gymnasium room, besides being entirely too small, is inconvenient, ill-ventilated, without bathing facilities, and generally inadequate for our needs (See Miss Moench's report).

A good modern gymnasium and armory, equipped with baths, dressing rooms, offices, apparatus, etc., could

be erected for about \$60,000. With the emphatic approval of the Athletic Committee, I wish to urge the necessity for such a building.

Athletics. Two years ago there was in the institution no adequate understanding among our students, of the real value existing in athletic games, and a large part of the work of the Department has been to create an appreciative attitude toward "sport for sport's sake." Although this work has got little more than fairly started, the results of our efforts are best shown by contrasting the group of about two hundred who attended a contest in football between this institution and the University of Utah, two years ago, with the organized student body, which, almost to a man, went to a similar contest this year.

It should be borne in mind that much of the value found in our contests for physical supremacy is in the consequent development of the moral qualities involved. On the part of the contestants, arise obedience to voluntarily imposed discipline, sacrifice of immediate pleasure for a worthy end, concentration of attention on the want of the moment, and the breadth and strength of character that comes through responsibility well carried. On the part of the student body, come pride in their college, enthusiasm in a common cause which results, as no other college experience can, in a spirit of true comradeship, and, finally, the training in a sane attitude towards success or defeat. These are of vital and primary importance in getting the full value out of our athletic games.

Equipment Required. In the preparation and provision for athletic contests, two distinct needs must be considered.

First, as suggested before, there must be a proper training and selection of men who are to represent their college. A large number of men must be got into training, that the best possible selection may be made. This means that we must have an ample gymnasium, a large campus covered with good sod, a well-built running track, and in the case of football a large number of suits, shoes, head guards, etc.

Second, provision must be made for watching the contest. Our students can be organized and taught to stand together only when opportunity is afforded for be-

ing shoulder to shoulder to encourage their men during a contest. Without a grand stand this is impossible. The students get mixed with the general public and lose all semblance of unity.

Furthermore, the matter of getting receipts is dependent for success upon the comfortable seating of our patrons; and gate receipts are an all-important factor in the maintenance of such contests. At present we have no seating arrangements whatever. All our important games are, therefore, held down town. Besides being forced to pay a considerable percentage of all receipts for the use of other grounds, there is the loss of emphasis of the fact that it is an Agricultural College contest. Our guests may come and go without any knowledge of any sort as to what kind of a place we live in, or what we are doing as an educational institution. Details of our needs in this matter of grand stands, as well as of campus, running track, etc., will sum up as follows:

Probable cost of grand stand, seating capacity one thousand	\$1,500.00
Water piping for campus (irrigation destroys the track)	300.00
Completion of running track	350.00
Equipment and maintenance of track (2 years). Miscellaneous equipment	200.00
	500.00
Total	\$2,850.00

Department
Contests.

There is frequent complaint in college circles that too much effort and money is expended on the handful of men constituting some particular team, while the students generally are neglected. The Department has sought to overcome this serious defect by encouraging second and third elevens for football, and by arranging inter-departmental contests in track and field sports. As a result in the case of football, the number of men participating has been nearly trebled in the past two years, somewhat over fifty men coming out this season. Many more would have joined the squad but for the lack of proper clothing, which, with most men, is too expensive to own. In track work the number has grown from a mere half-dozen to

about seventy-five who came under training last winter and spring. The number promises to be much greater this spring. This increase is due to the board track, which was built last winter at a cost of \$275.

Very many more of our young men may be interested in competitive sports through the organization of inter-departmental contests in basket-ball and baseball. The success of this sort of contest in track athletics leads us to believe that the departments may always be used as a satisfactory basis in the division of the students for athletic purposes.

Respectfully submitted,
GEORGE P. CAMPBELL,
Physical Director.

Department of Physical Education for Women.

To the President of the College,

Sir:—During the year 1903 there were no historical fundamental changes in the courses offered in this department. A thorough drill in gymnastic nomenclature was given, thus familiarizing the student with the terminology of the American Gymnasia—also training the mind to alertness and the body to a quick response. This, with the addition of some work in Medical Gymnastics, raised the grade of the work. As it was still found necessary for classes to meet on alternate days, neither the grade nor the character was all that could be desired. At the best, such gymnasium work is unsatisfactory, since it must be largely recreative.

Hence it was with great satisfaction that, in 1904, the classes were combined into one large section which meets daily. The work now is of the highest grade—considering the limited equipment. The course offered corresponds with those given in large universities and women's colleges. The students seem apter and better qualified for their work than during the preceding years, and in consequence of this, and the daily recitation, the character of the work is highly satisfactory. The attendance is regular. Two assistants were engaged this year. Their work so far has been painstaking and efficient.

In 1905 the work of Physical Culture should be organized into a department of Physical Education for Women. The interest, pride and loyalty on the part of the women, which would result from the feeling that they were a part of an organic whole, instead of unimportant factors in a detached section, would be sure to have its influence upon the character of the work. During the first year of the biennium, the Department would offer two courses in Physical Education, besides lectures and physiological discussions, and would endeavor to foster an association to encourage athletic sports among women.

In 1906 a third course would be added, to prepare

students to become teachers of Physical Education in public schools, high schools, etc., and to organize and conduct classes in their home towns.

In 1905 two assistants would be required about three hours a day, and in 1906 two assistants from four to five hours daily. For

A Gymnasium for Women. this work and even for the present courses, a gymnasium especially equipped for women is required. People are rapidly becoming sensible of the necessity for judicious, systematic physical training. To overcome defects, to correct deformities, to secure and insure health and strength, to develop the body and to put it into possession of its physical powers, we need modern gymnasiums properly equipped, as well as competent instruction and supervision. The question, it seems to me, is not so much can we afford to furnish gymnasiums with complete equipment for the Physical Education of our young women, as can we afford to neglect so important a phase of education.

The quarters at present in use for this purpose in the Agricultural College are inadequate and entirely unsuitable, for several reasons.

In the first place, the room is located on the third floor, and has so long been used as a gymnasium and dance hall that the walls have become weakened by the strain put upon them, so that the entire north wing will be threatened if the room is used much longer in its present capacity.

The acoustics of the room are such that it is impracticable to engage in athletics or gymnastics while classes are being conducted on the floors below; so that all such work must be limited to three hours a day. The women and the men have the use of the room one hour each day respectively for gymnastics, and the men one hour for basketball. The total inadequacy of such an arrangement for Physical Education must be apparent.

The women are further restricted in their work by the fact that the room is so constructed that it is impossible to avoid draft on the floor, hence mat work, recognized as one of the most desirable forms of physical exercise for women, must be abandoned during the winter term.

Again, the room is so shaped that it is impossible to set up many of the pieces of apparatus which are required

for development and corrective work, neither is there room to set up half of other apparatus so much needed.

But these are not the most serious objections to the present gymnastic quarters. From the position of the room in the building, it is impossible to afford bathing facilities for the women. The building could not be piped so that hot and cold weather could be furnished on this floor, even if there were room to put in the baths. The necessity for bathing after exercise is so appreciated by all, that it seems unnecessary to call the matter into question. People with any idea of personal cleanliness have a right to object to taking exercise, where no bathing facilities are afforded.

There is still another reason why we are in need of better quarters. We have but three rooms, measuring 12x14, in which the women may change costume for their exercise. In each of these rooms from twenty to thirty women must change costume daily. As the only means of ventilation is from the windows, and they cannot be raised while the room is occupied, because of draft and exposure, the air becomes very bad. It is a fact too well known to require assertion, that where much of the air is breathed over many times, it poisons the blood, enervates the entire system, and renders the person susceptible to any and every form of disease.

What we should have to carry on properly the work of Physical Education for Women is a modern gymnasium, preferably in a women's building, with suitable baths and lockers, an office and measuring room for the director, a class room large enough that the entire department could assemble for physiological talks and demonstration lessons, and an outer court which could be used by women for athletic sports.

With such a building and with the calisthenic apparatus we have on hand, the work of Physical Education could be carried on very successfully during the next two years, with an outfit of chest weights, anthropometric apparatus and other miscellaneous material, amounting to \$955.

Respectfully submitted,
RUTH EVELYN MOENCH,
Instructor in Physical Culture.

The Library.

To the President of the College,

Sir:—The following is a summary of Library accessions during the term beginning July 1, 1903, and ending November 5, 1904:

Books purchased (including exchanges)	869
Books by gift	690
	<hr/>
Total	
Total	1,559
Pamphlets by gift	1,145
Pamphlets on exchange and by purchase	404
	<hr/>
Total	1,549
Total accessions of titles	3,108
Present strength of the Library:	
Books	12,500
Pamphlets	11,000
	<hr/>
Total	23,500

The year's accessions are classified as follows:

	Pur- chased.	Gifts.	Total.
Periodicals	78		78
Cyclopedias and reference books ..	20	40	60
Philosophy and religion	9	2	11
Sociology (Pol. & Soc. Sc., etc.) ..	198	245	443
Philology	6	5	11
Natural Science	40	69	109
Useful arts (Inc. Dom. Sc. & Agri.).	112	215	327
Fine arts (Inc. Choir)	61	1	62
Literature	157	17	174
Fiction	95		95
History	93	96	189
	<hr/>	<hr/>	<hr/>
Total	869	690	1,559

Work
Done.

During this period the books have been classified according to the Dewey decimal classification, and a dictionary card catalogue has been completed for about two-thirds of them. The remainder will probably be catalogued by the close of the year. The shelf list is also on cards, and forms a classed catalogue for official use. The catalogue cards issued by the U. S. Agricultural Department for their publications have been received and filed, as also those issued by the Library of Congress, which indexes many of the public documents.

A department of duplicate books, magazines and pamphlets has been begun. A separate catalogue of these is being prepared. These duplicates are kept to be exchanged for duplicates of other libraries, which we desire.

The open shelf system has been adopted; the reader is allowed free access to the books. This has not resulted in any loss of books; and although the order of the books on the shelves may not always be perfect, and they may require re-arranging more often, yet the system has resulted in a saving of time to the assistant, and seems to meet with much satisfaction among the students.

The Library Course. A course in Library work has been introduced into the curriculum. This subject includes the general study of reference books, such as encyclopedias, dictionaries, atlases, cyclopedias of special subjects, indexes of periodicals and general literature, handbooks of information and public documents. Talks have been given on classification and cataloguing of the books in the Library, explaining their arrangement on the shelves, and the use of the card catalogue. Practical questions are given to the students to be looked up in the reference books. The object of the course is to familiarize the student with the Library, and to teach him how to obtain information quickly. As library interests grow in Utah and libraries are established in its cities, it is hoped that this course will develop into a Library-Science Course to be established at the College, that librarians may be trained here for that work.

Furniture. The Library occupies the entire front of the second floor of the Main Building. The large, well-lighted reading room is only in part suitably furnished. The books are well shelved in the Library Bureau standard steel stacks, the thirteen stacks which we now have being filled. We shall require four new ones to shelve the books which will be added to the Library during the following two years.

There is another great need in the Library which anyone will realize who considers that the atmosphere there should be such that a spirit of quietude will naturally prevail, from a reverence for books and a courtesy toward readers. There is nothing that will aid more in this object than a cork carpet, covering the floor of the reading room. This is not a luxury, but a necessity. It would make discipline in the Library practically uncalled for, because none would disturb an absolutely quiet room; while a little disturbance in a room already necessarily noisy, will not rest heavily on the conscience of anyone. This covering deadens the sound of steps and the movement of chairs. It is very durable, and is used now by all well-furnished libraries.

We need new chairs and tables, the chairs which are now in the Library being badly broken and few in number. The tables are very old and not at all suitable for our purposes. We should have a cabinet of maps, as they must be well kept and placed in such a way that they can be easily consulted. Shelves for reference books should be placed in the Reading Room. There must also be a filing cabinet for current periodicals, and a few small pieces of furniture.

The following is an estimate of the probable cost of this equipment:

4 Library Bureau steel stacks	\$ 300.00
18 feet of wall stacks for reference books.....	125.00
Complete equipment of tables and slopes for Reading Room and Stack Room	1,060.00
150 bent wood imported chairs at \$2.25	337.50
Periodical filing cases	50.00
Cork carpet for Reading Room	375.00
Spring back binders for periodicals	40.00
Desk chair (bent Wood)	5.00
Cabinet for maps	100.00
Miscellaneous equipment	300.00
Supplies	100.00
 Total	 \$2,797.50

Books. In providing a library with books it is well to consider the presence or absence of other libraries in the vicinity, and their character. As this is the only large library in northern Utah, it is expected that it will be used for a reference as well as a lending library, by the surrounding country. For this reason, efforts are being made to complete our files of Government documents, and many gifts have also been received of other publications of other states. Then it will logically follow that the Library must be well supplied with books of general interest, as travel, description, history, religion, and literature, as well as books of science which are not too technical for the general reader. These are all books which require money to obtain them.

While the growth of the Library during the last few years has been pleasing, it must be remembered that the courses are increasing in number and widening their scope each year. This makes the field broader which the Library must cover, therefore the sum of money must be increased also if the Library is to do its part and keep abreast with the other departments of the school. As it is, we are obliged to cover the field of literature in a broad sense, including history, biography, political and social science, also the more technical lines of science, agriculture, domestic science, technology, commerce, engineering, etc.

Of the money appropriated for the purchase

of books a certain sum should be considered for the purchase of reference books. These are expensive, but are of the most lasting character and are of absolute necessity to a well chosen library. We feel this necessity very keenly.

One of the most urgent needs of the Library is that its files of periodicals be completed. We have very few numbers before 1895, our first volume of Harper's Monthly being v. 86, of 1893. The files of periodicals are offered for sale by different book companies, often at low prices, and each year become more scarce and expensive.

Rigid economy will be exercised in the administration of the Library, both as to the assistance needed to conduct its daily routine, and as to supplies required. The greatest amount of money will be expended in permanent property—books, the most essential part of a library. Realizing that the least possible estimate must be made and that of only absolute necessities, the Library requests an annual appropriation of \$2,500 for books.

Respectfully submitted,
ELIZABETH CHURCH SMITH,
Librarian.

Agricultural Experiment Station.

To the President of the College,

Sir:—I have the honor to submit herewith a brief report of the work accomplished by the Utah Experiment Station during the past two years, the work proposed for the future, and the most pressing needs of the Station as evidenced by its present condition.

Work Accomplished.

For detailed statements of the work accomplished by the Experiment Station during the past two years, I refer you to the thirteenth and fourteenth Annual Reports of the Station. The following is a summary statement of the work done:

Irrigation. Irrigation investigations have continued to form the main part of our work. With the progress of the work, new methods and devices have been secured, until at the present time the experiment equipment in irrigation is of a very high order. Many thousands of measurements, analyses and other operations have been made in the prosecution of the work. The results obtained more than justify the expenditure of money, time and energy. It seems, at the present time, as if the science of irrigation, the foundation of which we are assisting in laying, will make irrigation agriculture more desirable in the minds of home makers than it has ever been before. As an evidence of the fact that our work in irrigation has been successful, I may mention that last year the Irrigation Investigations of the Department of Agriculture proposed that they enter into co-operation with us. This was agreed to, and last year \$2,400 were contributed by the U. S. Irrigation Investigations toward the irrigation work of this state with the understanding that the results obtained would be available for the use of the Department of Agriculture. The Bureau at Washington, this year, pro-

poses to contribute a larger amount to the prosecution of this work, provided the state will contribute a like amount. Though irrigation is of such a nature that it takes a number of years to obtain results that may be applied by the farmer, yet the results when once obtained are so far-reaching in their nature that there can be no question but that the irrigation investigations are of the most important work done by the Station.

Arid Farming. Of almost co-ordinate importance with the irrigation is the work which the Station has originated and is carrying in arid farming. With the immense area of non-irrigable lands in this state, any investigation having in view the establishment of farming without irrigation, must be important. The generous appropriation made by the last Legislature, which made possible the establishment of six experimental farms for conducting inquiries into the best methods of reclamation of our arid lands, will, if continued, result in the development of agricultural methods that will not only reclaim the arid lands, but will benefit the general agricultural practices of the state.

Alkali Reclamation. In an arid country, where the soils contain a great amount of soluble matter, the alkali question is certain to arise as soon as extensive irrigation is practiced. Studies having in view the reclamation of such alkali lands must necessarily go hand in hand with the irrigation studies. The alkali farm near Salt Lake City is now practically reclaimed. We are quite confident that good crops may be grown upon it next year. The alkali lands near Salt Lake City, however, represent only one class of such lands in the state, and before any reliable advice can be given the farmers, it is necessary to study the problem in other portions of the state, where the conditions of soil and irrigation are different. Then, too, under-drainage for alkali reclamation is an entirely new thing. Numerous practical problems in the domains of the engineer and the tile maker must be investigated and solved. As a beginning of the extension of this problem, our irrigation engineer, in company with the drainage expert of the Department of Agriculture, has examined a number of alkali-troubled districts of the state, and preliminary ex-

periments have been undertaken, having in view the ultimate reclamation of these lands. The Department of Agriculture has proposed to contribute some money towards such work, providing the state will contribute a like amount.

Soils and Waters. The conditions of the soils and waters of the state determine the degree of profitable farming. During the last nine years the Station has continued extensive studies upon the nature of both these agricultural factors in Utah. During the past summer, the final work was done on about 500 samples of soil from all parts of the state, and on upwards of 400 samples of water. This collection of analyses is, as far as I know, the most extensive in any arid country, unless it be California. A number of new pieces of apparatus and many new methods have been devised to study the soils in this investigation, with special reference to their use under conditions of irrigation. This work, when published, will undoubtedly be of high value to the farmers of this and surrounding states.

Sugar Beets. The sugar beet crop is now one of the most important field crops in the state. The Station has instituted experiments to make this crop more profitable to the farmer and manufacturer. Under our conditions of abundant sunshine and control of water, the very best yield of sugar beets containing the highest per cent of sugar should be obtained. One of the main considerations in successful beet raising is the possession of seed adapted to our climatic conditions and capable of yielding a high tonnage of first class beets under irrigated conditions. In connection with the U. S. Department of Agriculture, the Station has undertaken a series of elaborate experiments that will test all the leading varieties of sugar beet seed grown in the world, and will also attempt to develop varieties that are superior to any of those now on the market. After one year's work I am happy to report that the prospects are that we shall be successful in much of this work. These experiments are being conducted on a leased farm on which equipment valued at about \$1,000 has been placed. It is very desirable that this farm be acquired by purchase. I shall speak of this matter hereafter.

Horticulture.

The horticultural work which has been interfered with considerably during the last ten years because of the frequent changes in the direction of the department, has, during the past two years, been so organized that the change of horticulturist will not necessarily suspend the work in operation. It is planned hereafter that the department of horticulture shall test each year two important vegetables, giving attention to all the important questions of tillage and irrigation, and that this work be conducted until definite data are obtained, after which other vegetables will be selected to be investigated in the same way. I regret to say that with the means at our disposal, it has been impossible to undertake any extensive work relating to fruit growing. I trust this may be changed in the near future.

Entomology.

The work in entomology, which has so important a bearing on all horticultural industries, has been given more attention during the last two years than ever before in the history of the institution. Special attention has been given to the codling moth and the grasshopper; other insect pests will be taken up in the future.

Animal Husbandry.

The work in animal husbandry has been confined largely during the past two years to the study of the feeding value of the by-products of the sugar factory. Some experiments on the best methods of feeding various classes of farm animals with the foods available in this state have also been conducted. This very important field should be developed as soon as possible, but the lack of funds has made it impossible to do more than has been done during the past two years.

Publications.

Since my last report, thirteen bulletins and two annual reports have been published, besides numerous newspaper articles dealing with certain phases of the Station work, which have been prepared by members of the Station staff. Thousands of letters, asking for information, have been answered. One bulletin, embodying the results of five years' work in poultry is now in press, and another bulletin dealing briefly with the first year's work in arid farming is almost ready for the printer. Several other

bulletins are on hand in manuscript, and material is on hand for upwards of thirty bulletins. The titles of the bulletins published are as follows: No. 78, Lamb Feeding Experiments; No. 79, Process Butter; No. 80, Irrigation Investigations in 1901; No. 81, Poison in Water from a Gold and Silver Mill; No. 82, Feeding Beet Pulp to Steers and Sheep; No. 83, Pruning of Tree and Bush Fruits; No. 84, The Grain Smuts; No. 85, Pear-Blight; No. 86, The Right Way to Irrigate; No. 87, The Codling Moth; No. 88, The Relation of Smelter Smoke to Utah Agriculture; No. 89, A New Centrifugal Elutriator; No. 90, Beet Molasses and Beet Pulp Feeding with Sheep and Steers. As I have said in my last reports, so I may say now, that the work of the Station is quietly revolutionizing the methods of Utah agriculture.

Future Work.

Our future work is resting on a carefully prepared plan, the central subjects of which are irrigation and the profitable use of the lands of the state. The details of our proposed work I have submitted to you in earlier reports, and they have been discussed in the thirteenth and fourteenth Annual Reports of the Station. A distinctive feature of the operations of the Station at the present time is that all of the investigations are parts of a carefully matured plan, the completion of which is brought nearer with the ending of each year.

Needs of the Station. The calls for assistance made upon us by Utah farmers are very numerous and we find it quite impossible to investigate all the problems brought to our notice. We are now working upon a few important investigations only, yet it is becoming evident that we must curtail the work of some of the departments or obtain help outside of the Hatch fund. In many investigations the results would come more quickly and could perhaps be obtained more economically, were the the Station able to secure the full or nearly full time of the investigator, and to supply the present departments with more assistance than they now receive. The degree to which the Station can serve the agricultural interests of the state is directly dependent upon the funds placed at its disposal.

Publi-
cations.

I have explained in earlier reports the difficulty of publishing the results of our investigations in the best manner with the funds at our disposal. An immense amount of important data that would be of high value to the farmers is now awaiting publication, but there is small prospect, under present conditions, that more than a small fraction can be published within the next few years. A conservative estimate places the number of important bulletins that might be prepared from material on record at thirty. Unless the state comes to our rescue in this work, I can see only one way out of the difficulty: —one or more of the present departments of the Station, with all their lines of investigations, must be suspended for two or three years, and the money thus saved be used in preparing and printing the bulletins. It seems, in a manner, an injustice to deprive the farmers of the benefits that might come to them by publishing the results of important investigations. It is not merely the cost of printing that must be considered. The cost of tabulating the data and preparing them in a suitable form for the farmer is of equal importance. At least one clerk should be appointed whose special duty it should be to collect and prepare the data on our records for publication. The appropriation made for this purpose by the last Legislature was found to be entirely insufficient for this purpose.

There are also numerous insistent demands for new bulletins summarizing our work on lucern, poultry, stock feeding, etc., etc., to which we are unable, for lack of funds, to pay any heed whatever.

I suggest that it would be a good investment for the state to make an annual appropriation of \$2,000 for the purpose of publishing full reports of our investigations in behalf of the agricultural interests of the state.

More Land
Required.

At the present time the Station has not nearly enough land suitable for experimental purposes, at its disposal. We are now renting five acres of land on which the important sugar beet investigations are being carried on. We have already upwards of \$1,000 worth of equipment on this leased land, and we shall be obliged to add to this equipment each year. It would be a serious loss to us to be

obliged to return this land to the owner when our lease expires. The land should be purchased at the very earliest convenience. We have an option on the land for \$750; about \$500 are necessary for completing the flumes and fencing the land properly. On this leased portion of land not only is the work of sugar beets done but also all the work in horticulture and agronomy. We cannot get along with the land now owned by the institution.

Station and Agricultural Building. As time goes on it becomes more and more evident that the Station needs for its use a building, or part of a building, in which all of the main offices and work rooms of the Station

officers can be grouped. Nearly all of the experiments of the Station are of such a nature that most of the departments take part in them. It is practically impossible to keep duplicate records of all the work in the different departments; and, besides, the investigator should deal only with the original results. The loss of time, as well as the diminution in quality of the work done, owing to the difficulty of getting data in the possession of one department transferred to another department can scarcely be realized except by those who are intimately acquainted with the Station work.

All the records of the Station should be placed in a fire-proof vault and the main offices of all the Station departments should be near this storage room. At the present time the old fire-proof vault of the College has been placed at the disposal of the Station. Some of the Station officers are in the Station building and some are in the main building, and considerable labor is involved in carrying records to and from the vault. So great is the difficulty, that when records have to be used frequently it has not been found advisable to insist upon the storage of the records in the vault; as a consequence many thousands of dollars worth of work would be unavoidably destroyed should a fire occur in certain parts of our buildings.

The Station work is further of such a nature that frequent consultations between the heads of the departments are required. This also is made very difficult when the offices are scattered irregularly throughout the institution. The clerks employed by the institution do the work of all the departments, and, of course, they must be

located together. When a clerk is doing certain kind of work in one building and the head of the department for which he is working has his headquarters in another building, there is unavoidably a loss of time. The person calculating and tabulating important data must be in frequent communication with the head of the department in which the experiments were conducted.

All College departments find it beneficial to occupy rooms and offices that are grouped together. The Station needs this possibly more than any other department of the institution. The efficiency of our work would be greatly increased could a building or a part of a building be secured, containing the offices of all the Station departments, the main work rooms devoted especially to experimental work, including the Station chemical laboratory; and the rooms that are necessary for clerks, tabulators, mailing purposes and so forth. A very desirable arrangement would be to have a large agricultural building, including the agricultural departments, a wing of which could be assigned to the Station. I have not investigated the matter carefully, but judging from the cost of buildings recently erected in the state, I would estimate that \$20,000 to \$25,000 would be required for the construction of a Station building, that would meet our probable needs for a few years to come.

I may be allowed to add that the present Station building is in such a condition that it needs extensive repairs. The money required for this purpose might, to a great advantage, be put into a new building.

The general maintenance of the buildings and rooms now occupied by the Experiment Station, including light, heat, water, irrigation tax and janitorial services, should be met by the state. Inasmuch as I understand that it is the purpose to include this item in the call for general maintenance for the institution, I make no estimate for this item.

Summary of Needs. You will observe that only two items, namely, those of printing and land, are asked for by the Station at this time. In view of the important work which the Station is doing for the state, these modest requests should certainly be granted. I believe also it would be a wise investment

for the State to construct a permanent home for the experimental work of the College.

I need not probably add that the needs of the Station are not fully covered by these requests. We should have new horses, new wagons, new appliances in various departments, but I am asking only for those things which I consider of the greatest immediate importance.

The general condition of the Station is very good. The lines of work now followed yield good results. The work of the last two years has been very successful, and the officers are laboring unitedly and to the best of their ability for the furtherance of Utah agriculture. The future of the Station has never seemed brighter.

I thank you heartily for your assistance during the past two years.

Respectfully submitted,
JOHN A. WIDTSOE,
Director.

FARMERS' INSTITUTES.

Held July 1, 1903 to December 3, 1904.

DATE	CITY	COUNTY	Approximate Number Present
1903			
August 5	Plain City	Weber	150
August 6	Brigham City	Boxelder	100
August 7	Willard	Boxelder	250
August 8	Hooper	Weber	200
August 9	Layton	Davis	300
August 10	Farmington	Davis	200
August 11	Bountiful	Davis	150
August 12	West Jordan	Salt Lake	150
August 13	Murray	Salt Lake	90
August 14	Mill Creek	Salt Lake	6
August 15	Draper	Salt Lake	120
August 16	American Fork	Utah	500
August 17	Lehi	Utah	100
August 18	Pleasant Grove	Utah	150
August 19	Provo	Utah	40
August 20	Heber	Wasatch	300
August 21	Springville	Utah	125
August 22	Payson	Utah	150
August 23	Eureka	Juab	200
August 24	Spanish Fork	Utah	400
August 25	Mt. Pleasant	Sanpete	200
August 26	Ephraim	Sanpete	250
August 27	Gunnison	Sanpete	200
August 28	Salina	Sevier	250
August 29	Richfield	Sevier	350
August 30	Monroe	Sevier	175
August 31	Manti	Sanpete	300
September 1	Nephi	Juab	250
November 16	Providence	Cache	30
November 16	Millville	Cache	30
November 16	Wellsville	Cache	95
November 23	Hyrum	Cache	40
November 23	Paradise	Cache	75
November 23	Mendon	Cache	20
November 30	Smithfield	Cache	50
November 30	Hyde Park	Cache	50
December 7	Richmond	Cache	50
December 7	Lewiston	Cache	245
1904			
February 17	Manti	Sanpete	22
February 17	Manti	Sanpete	64
February 18	Logan	Cache	1000
February 19	Richfield	Sevier	16
February 19	Richfield	Sevier	32
February 19	Richfield	Sevier	55
February 20	Richfield	Sevier	60

DATE	CITY	COUNTY	Approximate Number Present
1904			
February 20	Richfield	Sevier	160
February 20	Monroe	Sevier	600
February 20	Richfield	Sevier	160
February 21	Glenwood	Sevier	200
February 24	Orangeville	Emery	150
February 24	Orangeville	Emery	200
February 25	Orangeville	Emery	200
February 25	Orangeville	Emery	250
February 26	Huntington	Emery	200
February 26	Huntington	Emery	200
March 5	Deseret	Millard	60
March 5	Deseret	Millard	50
March 7	Cedar City	Iron	125
March 8	Cedar City	Iron	400
March 8	Cedar City	Iron	200
March 8	Cedar City	Iron	200
March 11	St. George	Washington	250
March 12	St. George	Washington	600
March 13	St. George	Washington	125
March 13	Santa Clara	Washington	100
May 11	Parowan	Iron	66
July 7	Nephi	Juab	150
July 23	Monticello	San Juan	50
November 29	Fillmore	Millard	450 (4 meetings)
November 30	Fillmore	Millard	600 (5 meetings)
November 29	Tooele	Tooele	150 (2 meetings)
November 30	Tooele	Tooele	200 (2 meetings)
December 1	Nephi	Juab	325 (3 meetings)
December 2	Nephi	Juab	400 (3 meetings)
December 2	Beaver	Beaver	400 (4 meetings)
December 3	Beaver	Beaver	700 (5 meetings)

SUMMARY.

Number of meetings.....	95
Approximate total attendance...	15500
Approximate average	162
Approximate distance traveled..	6500 miles

Report of the Registrar.

To the President of the College,

Sir:—The report from this office may be made clearer and more comprehensive by means of a series of comparative tables, extending over several years of the history of the College.

Table No. 1 shows the number of students in the several schools and in the Preparatory Course.

SCHOOLS	92 -3	93 -4	94 -5	95 -6	96 -7	97 -8	98 -9	99 00	00 -1	01 -2	02 -3	03 -4
Agriculture.....	9	9	25	22	21	14	6	10	17	23	47	74
Dom. Sci. & Arts	48	32	100	84	47	44	62	61	57	82	116	134
Commerce	65	29	15	55	52	47	63	44	44	109	104	100
Eng'ring & M. A.	37	36	47	52	79	107	126	108	74	111	112	160
General Science..				11	11	12	15	19	14	14	14	17
Specials.....				9	25	31			14	8	16	
Preparatory	208	158	170	264	249	194	207	249	160	169	136	138
TOTALS, -	367	264	357	497	484	449	479	491	380	516	545	*623

*Including 27 students in the Summer School and 5 in Music and Language.

Table No. 2 shows proportion (per cent) of students in each of the different schools and in the Preparatory Course.

SCHOOLS	92 -3	93 -4	94 -5	95 -6	96 -7	97 -8	98 -9	99 00	00 -1	01 -2	02 -3	03 -4
Agriculture.....	2.5	3.4	7.0	4.4	4.4	3.0	1.3	2.0	4.5	4.4	8.5	11.9
Domestic Science	13.	12.0	28.	16.9	9.8	10.0	12.9	12.4	15.2	16.0	21.3	21.6
Commerce	17.8	11.0	4.2	11.2	10.4	10.7	13.1	9.0	11.6	21.0	19.0	16.0
Eng'ring & M. A.	10.	18.6	13.2	10.4	16.3	23.7	26.3	22.0	19.4	21.6	20.6	25.7
General Science					2.2	2.3	2.6	3.1	3.9	3.6	2.7	2.6
Specials					1.9	5.3	6.8			3.6	1.6	3.0
Preparatory	56.7	60.0	47.6	53.0	51.5	43.2	43.3	50.7	42.1	32.7	25.0	17.0

Table No. 3 indicates the enrollment in each department during the years specified. A computation of the actual number of credit hours (carried through a half-year) which were given in the department each year, gives the total units of registration. This number divided by the enrollment, gives the average registration, in credit hours, of each student in the department. Again the report of the current year, where complete, will show gratifying growth.

DEPARTMENT	1900-1			1901-2			1902-3			1903-4		
	Total Number of Students	Total Units of Registration	Av. Reg. for Student in Dept. in Year	Total Number of Students	Total Units of Registration	Av. Reg. for Student in Dept. in Year	Total Number of Students	Total Units of Registration	Av. Reg. for Student in Dept. in Year	Total Number of Students	Total Units of Registration	Av. Reg. for Student in Dept. in Year
Agriculture	17	220	8.1	27	165	6.1	49	559	11.4	82	774	9.4
Domestic Science and Art.....	62	537	8.7	88	1488	16.9	117	1548	13.1	149	1469	9.85
Commerce.....	58	543	9.4	135	958	7.1	144	1386	9.6	119	1145	9.6
Engineering.....	23	179	7.8	22	110	5.0	32	422	13.2	32	380	12.0
Mechanic Arts.....	106	946	9.0	114	774	6.79	144	1048	7.3	180	1114	6.2
Chemistry	31	246	8.5	35	262	7.48	40	339	8.5	41	361	9.0
Zoology and Entomology.....	15	111	7.4	56	302	5.4	70	295	4.2	99	318	3.2
Botany.....	17	51	3.0	13	39	3.0	24	67	2.8	26	51	2.0
Geology and Mineralogy.....	4	27	6.75	24	4.0	11	58	5.27	20	58	2.9	
Physics.....	49	354	7.2	29	156	5.4	23	138	6.0	31	186	6.0
Mathematics.....	323	3222	10.0	374	3762	10.0	417	4122	9.88	456	4166	9.1
English	357	4779	13.4	447	6198	13.8	488	5762	11.8	528	5786	10.8
Modern Languages and Latin	9	54	6.0	82	620	7.56	35	228	6.5	46	326	7.0
History.....	144	839	5.8	165	1062	6.4	168	1024	6.1	183	1056	5.77
Drawing	162	622	3.8	74	378	5.0	127	518	4.0	144	538	3.7
Geography	66	660	10.0	114	1060	9.3	103	603	6.0	93	438	4.7
Penmanship.....	116	464	4.0	185	370	2.0	159	318	2.0	142	476	3.35
Music	1	4	4.0	192	422	2.0	110	254	2.0	8	24	3.0
Military Science and Tactics	147	294	2.0	211	508	2.0	110	220	2.0	202	404	2.0
Athletics and Gym. for Women	46	92	2.0	96	2.0					99	198	2.0
Nature Study										13	65	5.0
Psychology										3.0		

Table No. 4 indicates the number of graduates, with degrees and with certificates, from each of the schools during the past eleven years.

	Agriculture		Domestic Science			Commerce		Gen Sc.	Eng. and M. A.			
	High School	Degree	High School	M. T. D. A.	Degree	High School	Degree		C.E.	M. E.	M. T. M. A.	Total
1894	2	1	.....	2	1	7	1	1	2	.....	.....	17
1895	.....	1	.....	.....	.....	3	.....	.....	1	.....	.....	5
1896	.....	3	.....	.....	.....	2	.....	1	2	1	.....	9
1897	1	1	.....	.....	.....	5	2	3	4	1	.....	17
1898	.....	.....	.....	.....	.....	2	1	1	.....	1	.....	6
1899	.....	1	.....	.....	.....	1	4	4	1	4	3	18
1900	.....	.....	.....	3	2	2	1	1	3	1	1	14
1901	.....	.....	.....	1	1	.....	.....	3	1	.....	1	7
1902	.....	.....	.....	1	.....	3	.....	2	.....	1	.....	7
1903	.....	1	1	6	2	2	.....	2	5	2	2	21
1904	.....	1	2	6	2	5	2	5	3	1	2	29
	3	9	3	19	16	31	12	21	22	5	9	150

Total Certificates 64

Total Degrees..... 86

A number of other tables and computations have been made, but the ones given above are the most complete and significant.

Respectfully submitted,

JOHN T. CAINE, JR.,
Registrar.

Report of the Superintendent of Buildings.

To the President of the College,

Sir:—In compliance with your request, I hereby submit the following estimate of the requirements for the next biennium:

STEAM HEAT.

One 800 H.P. Steam Boiler for Heating Plant	\$1,100.00
One "Ideal Sectional Steam Boiler," capacity 2,200 feet, for Dormitory. Cost, including freight and setting up	625.00
Extending smoke stack of main boiler or purchase of fan to provide draught	300.00
Covering for steam pipe in boiler room and basement	60.00
General repairs for steam plant, packing, fittings, etc.	250.00
	2,335.00

WATER WORKS.

General repairs	200.00
Connecting Main Building to water main on north-east of Main Building for additional pressure to supply fire hose, requiring 80 feet of 4-inch pipe, the digging of 80 feet of trench, etc.	125.00
Putting in new hydrant south-east of Main Building for fire protection, requiring 250 feet of 4-inch pipe (including labor)	375.00
12 hose racks	60.00
1,200 feet of cotton hose, rubber lined, for fire protection in Main Building	500.00
Extending water pipes to two north Cottages	75.00
3 stand pipes in Main Building for fire protection, with valves	100.00
	1,435.00

SEWERAGE.

New cesspool for Main Building, including cost of digging, building rock wall, covering with railroad iron	150.00
150 feet of 6-inch pipe to connect sewer system with new cesspool, and cost of laying same	150.00
Carting away gravel from new cesspool	15.00
General repairing of sewer system.	185.00
	500.00

PAINTING.

Conservatory, inside and out	50.00
Boiler House, roof and windows ..	50.00
Horse Barn, outside, excluding roof ..	240.00
Station Building, excluding roof...	75.00
Dromitory, inside and out, including roof	450.00
Three cottages, inside and out and roof	225.00
Sheep Barn, outside and roof and inside surfaced lumber	300.00
Cattle Barn, outside, roof, and inside surfaced lumber	530.00
Piggery, outside, roof, and inside surfaced lumber	100.00
Small Cattle Barn, outside and roof	25.00
Poultry Building, inside and out, including roof	240.00
West Campus fence	75.00
Mechanic Arts Building, outside and inside, excluding roof	200.00
Transformer House	20.00
Roof of central front of Main Building, doors, windows, cornices, etc.	800.00
Painting stairways, oiling floors, etc	300.00
	3,675.00

GENERAL REPAIRS.

Repairs on Main Building	500.00
Furniture	150.00
Windows, glazing, etc.	300.00
Plastering	200.00
Window shades	50.00
Gas repairs	100.00
Telephone lines and batteries	200.00
Electric lights	750.00
Picket fence in front of cottages ..	140.00
Partition fences between cottages..	45.00
Miscellaneous	350.00
	2,785.00

FUEL.

Fuel required for two years	6,500.00
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LABOR.

Firing boilers	1,000.00
Extra labor for two years	600.00

Tools, oil, pipe and fittings for re- pair shop	200.00
Hardware—locks, hinges, etc.	100.00
	300.00
Total required for the two years..	\$19,130.00

Respectfully submitted,

CHARLES BATT,
Supt. of Buildings.

—THE—

Biennial Report of the Secretary

OF THE

Agricultural College of Utah

For the Biennial Period Ending
December 31, 1904.

Logan, Utah, January 4th, 1905.

To the Board of Trustees of the Agricultural College of Utah:

Ladies and Gentlemen:—The Secretary respectfully submits his report of the receipts and expenditures of the College during the biennial period from January 1st, 1903, to December 31st, 1904, with an inventory of the College property.

Respectfully submitted,

J. A. BEXEL,

Secretary.

REPORT OF THE SECRETARY

For the Biennial Period ending Dec. 31, 1904.

THE COLLEGE.

Receipts.

From Federal Government:

Balance January 1, 1903.....	\$12,164.43
Appropriation.....	50,000.00

From State Treasurer:

For General Maintenance.....	94,372.10
For General Equipment	23,315.82
For Buildings and Improvements	17,567.16
For Pure Bred Stock.....	69.44

Miscellaneous:

Fees.....	9,550.40
Miscellaneous Sales	6,058.61
Dormitory Rental.....	419.50
	16,028.51
Bookstore Sales	7,931.09
Total.....	221,448.55

EXPENDITURES

*Overdraft, (due from State)
January 1, 1903..... \$ 4,093.79

Salaries:

From Government Fund	\$49,401.50
From State Fund	45,394.42
	<hr/>
Janitorial Labor.....	4,428.97
Equipment	23,535.95
Supplies.....	17,529.50
Traveling Expenses.....	797.55
Water Tax	692.73
Water system.....	172.56
Insurance	1,487.10
Telephone and Telegraph..	556.02
Light and Power.....	1,417.97
Postage and Stationery....	1,338.71
Fuel	5,004.50
Heating Plant.....	440.45
Printing and Advertising...	6,519.77
Office Labor.....	1,009.94
Repairs	6,903.26
Buildings	15,842.16
Improvements.....	8,389.68
Unclassified Expenses	1,372.76
Bookstore.....	8,325.35
	<hr/>
Balance Government Fund.....	12,762.93
Balance State Fund, (including cash & revolving fund \$303.47)	4,030.98
	<hr/>
Total.....	221,448.55

II. ARID FARMS.

Receipts.

State Appropriation ...	12,500.00
Sales	170.79
Over Draft	479.30

Total \$13,150.09

Expenditures.

Salaries and Labor	8,143.02
Equipment	2,021.73
Supplies	1,893.74
Traveling Expenses....	1,091.60

Total \$13,150.09

*This amount does not agree with the last biennial report, but it is based on Auditor Beatie's statement, February 26, 1904.

The overdraft shown by the last report is \$770.16.

III. FARMERS' INSTITUTES.

Receipts.

From State Treasurer	2,795.82
Overdraft (Due from State).....	82.13

Total	\$ 2,877.95

Expenditures.

Traveling Expenses	1,324.80
Printing	566.33
Unclassified	986.82

Total	\$ 2,877.95

IV. EXPERIMENT STATION.

Receipts.

Government Fund	30,000.00
Miscellaneous	3,772.63

	33,772.63
Less Overdraft December 31, 1902.	864.07

Total	\$32,908.56

Expenditures.

Salaries	15,694.89
Labor	8,038.20
Publications	512.70
Postage and Stationery.	592.66
Freight and Express . . .	61.12
Heat, Light, Water and Power	309.96
Chemical Supplies.....	803.35
Seeds, Plants, and Sundries Supplies	1,121.82
Fertilizers	132.76
Feed Stuffs	1,977.55
Library	142.43

Tools, Implements and Machinery	848.26
Furniture and Fixtures	118.90
Scientific Apparatus ...	122.08
Live Stock	363.10
Traveling Expenses ...	700.40
Buildings and Repairs.	290.00
Contingent Expenses ..	423.87
Balance Unexpended ..	654.51
<hr/>	
Total	32,908.56

V. TREASURER'S REPORT.

Herewith please find statement of balances in various funds in my hands as Treasurer of the Agricultural College of Utah at the close of business December 31, 1904.

State Fund	5,869.34
Government Fund	14,804.84
Station	864.13
Station Miscel.	415.36
<hr/>	
Total	21,953.67

Respectfully submitted,
 ALLAN M. FLEMING,
 Treasurer.

VI. PROOFS.

State Fund:

Arid Farm and Farmers' Institute are included in the Treasurer's report on the State Fund.

Balance as per report

No. I.....	4,030.98
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Overdraft as per report

No. II.....	479.30
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Overdraft as per report

No. III.....	82.13	561.43
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	3,469.55
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Outstanding Warrants.

	2,703.36
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Total	6,172.91
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Less Cash on Hand.	303.47
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Total	5,869.44
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Less Difference between Treasurer's report and Secretary's Record February, 1900. .10

Balance State Fund as per Treasurer's Report, above.....	5,869.34
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Government Fund:

Balance as per Report

No. I.....	12,762.93
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Outstanding Warrants	2,041.91
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Balance as per Treasurer's report, above	14,804.84
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Experiment Station Fund:

Balance as per report

No. IV.....	654.51
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Outstanding Warrants	624.98
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Balance as per Treasurer's report, above	1,279.49
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VII. RECAPITULATION.

Summary of Receipts.

I	For College	221,448.55
II	For Arid Farms	12,670.79
	Overdraft	479.30
III	For Farmers' Institutes	2,795.82
	Overdraft	82.13
IV	For Experiment Station....	32,908.56
		<hr/>
	Total	270,385.15

Summary of Expenditures.

I	For College.....	204,654.65
	Balance	16,793.91
II	For Arid Farms	13,150.09
III	For Farmers' Institute	2,877.95
IV	For Experiment Station....	32,254.05
	Balance	654.51
		<hr/>
	Total	270,385.15

VIII. THE AUDITORS' REPORT.

We, the undersigned, duly appointed Auditors, do hereby certify that we have examined the books and the accounts of the Agricultural College of Utah for the biennial period ending December 31, 1904; that we have found the same well kept and classified as above, and for all of which proper vouchers are on file and have been by us examined and found correct.

LORENZO HANSEN,

L. A. OSTIEN,

Auditors.

Inventory.*

DECEMBER 31, 1904.

I. The College:

Land, 116 acres at \$125...	\$ 14,500.00
Buildings (including fixed equipment, water works and sewerage system)...	276,263.53

Equipment:	\$72,014.12
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Offices:	\$1,297.15
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President's Office.....	\$ 990.00
Secretary's Office.....	156.40
Registrar's Office.....	150.75

Departments of Instruction:	48,959.52
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Agronomy	1,367.69
Animal Industry.....	5,538.20
Veterinary Science....	436.60
Art	392.70
Chemistry	2,562.41
Commerce	2,052.35
Dom. Science and Art	2,359.35
Engineering and M.A.	23,746.61
English.....	140.00
Geology & Mineralogy	694.50
History and Civics	84.50
Horticulture & Botany	1,556.00
Mathematics & Astron.	545.50
Military Science.....	50.10
Modern Languages....	21.30
Music.....	1,770.00
Physics	822.65
Physical Education....	1,258.76
Zoology & Entomology	3,530.30

Assembly Room.....	3,460.05
Library(Inc.Bks & Priod'l's	10,962.00
Halls & Private Rooms...	317.85
Bookstore	302.60
Janitorial.....	49.85
Construction, Repairs &	
Plumbing.....	895.15
Dormitory	481.95
Sub Station	5,288.00

*Not including expendable supplies and Government Land Grant.



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156

II. Experiment Station, Equipment & Livestock.....	10,863.40
Offices (Inc. books).....	1,719.90
Departments	9,143.56
Poultry	920.75
Irrigation	64.85
Entomology.....	1,024.70
Chemistry.....	2,397.06
Horticulture	1,064.20
Animal Industry.....	752.10
Agronomy.....	2,919.90
III. Arid Farm Equipment.....	875.05
IV. Farmers' Institute Equipmt.	528.50
Total Equipment.....	84,281.13
V. Bookstore Merchandise.....	2,220.99
Grand Total	377,265.65